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## Working Group 1: Europe's energy policy and security of supply

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## Energy Policy in the European Union

Beyond the long term objective of forming part of the general aims of EU economic policy, the 1995 'White Paper on Energy Policy for the EU', for the first time identified that EU energy policy should pursue the three main objectives of competitiveness, security of supply and protection of the environment. In the context of new energy and climate change realities facing Europe in the 21st century, the objectives were reconfirmed in 2006 by the Green Paper on a European Strategy for Sustainable, Competitive and Secure Energy. Hence in recent years, activity has been more intense than ever in the energy policy field, aiming to update and revise the European energy policy.

The EU Treaty confirms that although energy policy is largely regarded as the Member States' responsibility (subsidiarity principle), the sphere of EU activity does encompass the energy sector. Should the Lisbon Treaty (signed in December 2007) come into force, it will signal a further move towards a common energy policy, by introducing a distinct chapter on energy (Title XX, Art 176A), making energy policy a shared competence. Under this new article, the main aims of EU's energy policy would be "in a spirit of solidarity between Member States" to:

- ensure the functioning of the energy market;
- ensure security of energy supply in the Union;
- promote energy efficiency and energy saving and the development of new and renewable forms of energy; and
- promote interconnection of the energy networks.

Which ever way viewed, security has been and remains a central element of the energy policy of the European Union.

## Security of energy supply and risk elements

### a. Definition of security of energy supply

Energy security is obtained when there is an uninterrupted supply of energy, in terms of quantities required to meet demand at affordable prices<sup>1</sup>. Security of energy supply may be defined as the ability to minimise the effects on users of disruption to energy supply or price volatility. At the policy making level the concept of security of supply is often also used to describe measures to reduce vulnerability, adequate investments, diversification of energy sources, fuel origins and routes, technical reliability and flexibility of energy systems.

In a strict definition of energy supply, the main risks to be considered are<sup>2</sup>:

1. Manipulation of prices (e.g. oligopolistic pricing behaviour of energy suppliers or speculation);
2. Disruption of supplies through deliberate behaviour of energy producers;
3. Disruption of supplies because of accident (or lack of investment) or natural disaster.

While security of supply risks are primarily due to events of international relevance (wars, financial crisis etc.), there are also risks of supply disruption arising within the EU (for instance power cuts due to lack of infrastructure investment or natural disasters).

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<sup>1</sup> World Energy Council, Europe's Vulnerability to Energy Crises: Executive Summary, p. 1.

<sup>2</sup> Definition adapted from J.H. Keppler "La sécurité des approvisionnements énergétiques en Europe: principes et mesures", April 2007, Note for the IFRI.

**Box 1: Time line of some major events affecting global security of energy supply (disruptions, price increases and crises)**

Date	Event
Nov 1956 - Mar 1957	Suez crisis
Jun - Aug 1967	Six day war
Oct 1973 - Mar 1974	Arab-Israeli war and OPEC oil export embargo by many major Arab oil-producing states, in response to western support of Israel during the Yom Kippur War
Nov 1978 - Apr 1979	Iranian revolution
Oct 1980 - Jan 1981	Outbreak of Gulf War (Iran-Iraq) - spike in oil price
Aug 1990 - Jan 1991	Iraqi invasion
2000 -2001	California electricity crisis (following deregulation) - high prices and black-outs
2000	UK fuel protest over raise in crude oil price and high taxation of road fuel
Jun - Jul 2001	Iraqi oil export suspension
Dec 2002 - Mar 2003	Venezuelan strike causing decreased exports
Mar - Dec 2003	War in Iraq
Summer 2003	Power cuts in several EU Member States (Italy, UK, Denmark, Sweden)
2004	Argentine energy crisis - a natural gas supply shortage with lacking emergency reserves
Sep 2005	Hurricanes Katrina/Rita
Mar 2005 - Jan 2006	Russia-Ukraine gas dispute (over the price of natural gas and prices for the transition of Gazprom's gas to Europe)
4 Nov 2006	Power black out in Germany leading to supply disruptions across most of Western Europe with 10 million people without electricity for hours
Jan - Aug 2007	Russia-Belarus energy dispute
2008	Central Asia energy shortage after abnormally cold temperatures and low water levels in an area dependent on hydroelectric power. Electricity shortage in South Africa.

**b. Dependency**

The risk of supply disruptions has grown in recent years for a number of reasons including continued demand growth, increased concentration of the remaining oil reserves in a smaller number of countries, the concentration of oil use in the transport sector, and insufficient capacity additions (both upstream and downstream) to keep pace with demand<sup>3</sup>.

According to the European Commission's (EC) Green Paper on an Energy Strategy for Europe<sup>4</sup>, the EU's energy dependency could climb from 50% in 2000 to 70% in 2030 if no action is taken. The EU energy demand has stabilised the last couple of years, however due to a decrease in energy production the EU energy dependence rate in 2006 rose to 54%. Overall, between 1997 and 2006 the EU27 energy production fell by 9%, consumption rose by 7%, and net imports increased by 29%<sup>5</sup>. Other regions like Asia and the Americas have rising energy demands, increasing the global competition for energy sources. Global energy demand is expected by 2030 to rise by 60%

**Box 2: Main imported fossil fuels**

<b>Oil</b>	<ul style="list-style-type: none"> <li>Oil represents 37% of total EU energy consumption</li> <li>EU produces only the equivalent of 17% of EU oil consumption</li> <li>33% of imports come from Russia, 21% from Middle East, 16% from Norway, 12% from North Africa</li> <li>By 2030, EU import dependency is forecasted to rise to 95% of EU oil consumption</li> </ul>
<b>Gas</b>	<ul style="list-style-type: none"> <li>Gas represents 24% of total EU energy consumption</li> <li>EU produces less than 40 of % domestic production</li> <li>42% of imports come from Russia, 31% from North Africa, Nigeria and Middle East, 24% Norway</li> <li>By 2030, overall EU gas import dependency is expected to pass 80%, with over 60% imports to come from Russia</li> </ul>
<b>Coal</b>	<ul style="list-style-type: none"> <li>By 2030, 85% of EU needs expected to be covered by imports.</li> </ul>

<sup>3</sup> Source: IEA online 2008.

<sup>4</sup> A European Strategy for Sustainable, Competitive and Secure Energy, COM(2006)105 of 8.3.2006.

<sup>5</sup> Eurostat newsrelease 10 July 2008, and Eurostat energy data online.

compared to 2002<sup>6</sup>.

The table to the right indicates the particular situation for main imported fossil fuels<sup>7</sup>.

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<sup>6</sup> IEA World Energy Outlook 2004.

<sup>7</sup> Figures are for year 2006 based on Eurostat data from May 2008, published by the EC in Statistical Pocketbook; Trends to 2030 - Update 2007" published April 2008 by EC DG for Transport and Energy; and IEA World Energy Outlook 2004.

### c. Price volatility

The last months have yet again demonstrated the volatility of energy prices with oil rising above \$146 per barrel in June, only to fall again below \$100, for the first time in over six months, by mid September 2008. Since the outbreak of the financial crisis, the oil market has been falling parallel to stock markets and stands today at \$59 a barrel<sup>8</sup>.

Some market analysts believe that a good proportion of the price increase has been due to market speculation on "energy futures". Other economists believe that fundamental supply-demand imbalance independent of speculative activities led to the price increase. There seems to be some agreement, however, that over the short term, speculation may have some part to play and that schemes to dampen energy speculation may be helpful. In this regard, legislation is under adoption in the US for the strengthening of market control measures on the energy market<sup>9</sup>.

The IEA in its new World Energy Outlook predicts that as soon as the world economy recovers from the current financial crisis, oil prices will rise to above \$100 a barrel. The IEA also predicts the price will exceed \$200 by 2030<sup>10</sup>. In September the EP called in a Joint Resolution<sup>11</sup> for a strong political commitment for concrete measures towards cutting energy demand, to promote renewables and energy efficiency, and to pursue diversification of energy supply and reduce dependence on imported fossil fuels. Members called on Commissioner Piebalgs and the French Presidency to come up with measures to make oil markets more transparent and to break the link between oil and gas prices and high energy prices.

### d. Price control

On 24 October 2008 in Vienna, oil ministers from OPEC, in reaction to falling prices and slowing demand, decided to cut their total production by 1.5 million barrels per day. The decrease from the cartel's current quota of 28.8 million barrels per day, took effect from the start of November<sup>12</sup>.

Despite the news, benchmark light sweet crude oil fell by more than \$3 a barrel to around \$64. OPEC's reduction of supply is deemed to take some time before it is actually felt on the markets and before a floor price is met, while oil prices could still be falling parallel to stock markets<sup>13</sup>.

In parallel, on 21 October 2008, officials from Russia's gas monopoly Gazprom met counterparts from Iran and Qatar<sup>14</sup> to discuss setting up a natural gas cartel (a "Gas-OPEC"), which, if it comes to life, would control 60% of the world's gas supplies<sup>15</sup>. The announcement led to fears of price increases, and the EC reacted with opposition to the creation of a gas cartel that would try to control prices<sup>16</sup>. Analysts have said that a gas cartel similar to OPEC would not be possible to function in terms of a gas market since, at least in the short term, gas transportation being very rigid and subject to long-term contracts. The fear is that cooperation to develop the LNG business globally in the long run could become a price-setting mechanism, just as OPEC did in 1973 after the Yom Kippur oil crisis.

### e. Infrastructure

Energy infrastructures globally and within the EU are key assets for ensuring adequate supply and distribution of energy to the EU's economy and to the development of the energy market. The power cuts and electricity blackouts that occurred repeatedly in Europe in the year 2003 demonstrated the need to strengthen energy networks in Europe, and most importantly

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<sup>8</sup> Value on 12 November 2008, crude oil \$59.36 on <http://www.oil-price.net/>. and \$58 <http://www.nymex.com/index.aspx>

<sup>9</sup> The bill passed through the Congress in September 2008, over-riding the US President's veto - <http://www.nytimes.com/2008/09/19/business/19speculate.html>.

<sup>10</sup> IEA World Energy Report, due week 46 2008, summary of report to be found in FT.com, 5. november 2008, "Highlights of the IEA report" + "IEA predicts oil price to rebound to \$100".

<sup>11</sup> Parliament resolution of 25.09.2008 on getting a grip on energy prices, P6\_TA-PROV(2008)0460.

<sup>12</sup> Press release OPEC '150th (Extraordinary) Meeting of the OPEC Conference', 24 October 2008.

<sup>13</sup> [http://online.wsj.com/article/SB12250698555270797.html?mod=googlenews\\_wsj](http://online.wsj.com/article/SB12250698555270797.html?mod=googlenews_wsj).

<sup>14</sup> <http://www.neurope.eu/articles/90317.php>.

<sup>15</sup> <http://www.guardian.co.uk/business/2008/oct/22/gas-russia-gazprom-iran-qatar>, Macalister, The Guardian, 22 October 2008.

<sup>16</sup> Gas cartel plan attacked, European Voice 22 October 2008.

provide alternative transit routes so that isolated incidents are less likely to have devastating consequences on a global scale.

In addition, rules need to ensure adequate levels of investments in energy generation, gas transport, electricity transmission, including for instance for the connection of off-shore wind farms or for distributed generation. A strong internal competitive market is necessary to generate much needed investment signals (to network operators and generators) and to ensure network access.

The third energy package on the EU electricity and gas market<sup>17</sup>, aiming at strengthening the internal market is currently being negotiated in Council and Parliament (elements of the package are addressed later in this note).

Infrastructure outside the EU is often discussed at EU level, as the need for further investments is vital for the continued delivery of sources but problematic due to geopolitical tensions (further discussion of the infrastructure issues outside the EU see section 3.2.2).

### **How may Europe respond to energy security threats?**

Possible responses to energy security threats include<sup>18</sup>:

2. Maintaining adequate security stocks and establishing solidarity & cooperation mechanisms;
3. Promoting diversification, including both development of alternative energy sources (such as RES) and diversifying supply and geographical sources;
4. Reduction of absolute levels of energy consumption (EE).

Parliament has advocated an approach to the Union's energy security that follows several tiers, namely: lowering dependency on external partners through greater diversification, including the use of Renewable Energy Sources (RES), greater Energy Efficiency (EE), and the development of the internal energy market. The Parliament also advocates a stronger common approach to energy in the foreign policy<sup>19</sup>.

#### **a. Security stocks, solidarity and cooperation mechanisms**

##### **1.1.1 Maintaining strategic security stocks**

The IEA is responsible for emergency responses in case of global disruptions, and its members are required to establish strategic oil reserves equivalent to at least 90 days of net oil imports. IEA stocks stood at 4.1 billion barrels at the end of 2006, covering 122 days of net imports. In 2007, 17 out of the 26 members of the IEA held public stocks. With the accession of Poland and the Slovak Republic to the IEA, it is anticipated that 20 out of 28 IEA member countries will have public stocks by 2008.

IEA members must also maintain emergency response measures that can contribute to an IEA collective action during a severe oil supply disruption. Response measures include stockdraw, demand restraint, fuel switching, surge oil production and, if necessary, sharing of available oil supplies.

The use of security stocks can be a short run solution to diminished/lacking supply. There is some debate whether security stocks should also be used to smooth market fluctuations or to address physical disruption.

Several EU Member States are not members of the IEA. However since the 1960s, the EU has also been aware of the need to prevent potential oil supply shortages and has required Member States to maintain oil stocks to ensure security of supply<sup>20</sup>. Current legislation imposes Member States to maintain minimum stocks of crude oil and/or petroleum products for at least 90 days. But current shortcomings include a lack of coherent organization of Member States' systems (public and industrial stocks) and the lack of an EU efficient decision-making mechanism in supply crisis. A full EU participation in an IEA action could require a common EU mechanism.

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<sup>17</sup> See [http://ec.europa.eu/energy/electricity/package\\_2007/doc/2007\\_09\\_19\\_explanatory\\_memorandum\\_en.pdf](http://ec.europa.eu/energy/electricity/package_2007/doc/2007_09_19_explanatory_memorandum_en.pdf).

<sup>18</sup> Risk factors not considered in this paper include for instance delays in investments, shortages and terrorist attacks. For more on these see inter alia "Europe's Vulnerability to Energy Crisis" World Energy Council analysis 2008.

<sup>19</sup> Prospects for the internal gas and electricity market, Vidal-Quadras (EPP-ED, ES) for ITRE (INI/2007/2089); Joint resolution on security of energy supply in the European Union (RSP/2006/2530); Resolution on Energy efficiency or doing more with less, Vidal-Quadras (P6\_TA(2006)0243); Resolution on oil prices and dependence on oil, (RSP/2005/2603); Resolution on Green Paper towards a European strategy for the security of supply, Chichester (P.392-543E/2001).

<sup>20</sup> Directive 2006/67/EC imposing an obligation on MS to maintain minimum stocks of crude oil and/or petroleum products.

A revision of the EU oil stock Directive is to be proposed in November 2008<sup>21</sup>, aiming at further reducing risks by improving availability and mechanisms of emergency stocks; and it is foreseen to demand weekly publication of oil stocks.

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<sup>21</sup> 2008/TREN/001, Revision of Directive 2006/67/EC with the aim of strengthening the European emergency oil stocks system.

There is no EU legislation on gas stocks, but the idea has been raised in several rounds. Parliament has in an own initiative report indicated that it would prioritise diversification of supply routes and technologies (including degasification plants and LNG terminals) over massive stocks, however, did stress that the EC should propose how to make better use of existing stocks<sup>22</sup>.

### 1.1.2 Improving cooperation and solidarity mechanisms

In 2004 EU measures were introduced to establish a common framework within which Member States can define their general security-of-supply policies for the gas market, in a manner that is transparent, solidarity-based, non-discriminatory and consistent with the requirements of a single market<sup>23</sup>. Similarly, measures to safeguard security of electricity supply and infrastructure investment were adopted in 2005 aiming to ensure the proper functioning of the internal market for electricity, an adequate level of interconnection between Member States, an adequate level of generation capacity and balance between supply and demand<sup>24</sup>.

To provide a European outlook on the possibilities to export and import electricity and gas in peak demand conditions, the third energy package proposes that the Network of European Transmission System Operators (TSOs) is given the task of making system adequacy forecasts for every summer and winter as well for the long term<sup>25</sup>. It also proposes that Member States cooperate to promote regional and bilateral solidarity, to tackle situations likely to result in severe disruptions of gas supply affecting a Member State. Cooperation measures are to include the streamlining of national measures to deal with emergencies, the identification, development or upgrading of electricity and natural gas interconnections and the elaboration of practical modalities for mutual assistance<sup>26</sup>. Furthermore, the creation of a European Agency for the Cooperation of Energy Regulators<sup>27</sup> with enhanced roles for regulation, coordination and supervision of Member States' gas and electricity TSOs<sup>28</sup>, would be given a strong role in improving coordination and cooperation of Member States on security of supply issues.

The European Council in March 2007 called for an effective crisis response mechanism to build on mutual cooperation and existing mechanisms<sup>29</sup>. This was in October 2008 further reflected in a request for the EC to develop a crisis mechanism that may deal with temporary disruptions to supplies<sup>30</sup>.

With regard to responding to security threats such as terrorist threats, a Green Paper on a European Programme for Critical Infrastructure Protection was presented by the EC in November 2005<sup>31</sup>. The adoption of a Directive on the identification and designation of European Critical Infrastructure and the assessment of the need to improve their protection is still under debate in the Council<sup>32</sup>.

## b. Promoting diversification

Having a diversified energy mix in the EU is desirable for ensuring energy security, as repeatedly advocated by the EC and EP. However the choice of energy mix remains a prerogative of Member States, and with no Lisbon treaty in place (and therefore no Energy

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<sup>22</sup> INI/2007/2089

<sup>23</sup> Directive 2004/67/EC on measures to safeguard security of natural gas supply.

<sup>24</sup> Directive 2005/89/EC concerning measures to safeguard security of electricity supply and infrastructure investment.

<sup>25</sup> Revisions to Regulations (EC) No 1228/2003 and (EC) No 1775/2005 proposed in September 2007.

<sup>26</sup> COM(2007) 529 final, amending Directive 2003/55/EC concerning Common rules for the internal market in natural gas.

<sup>27</sup> COM(2007)0530 Proposal for a Regulation of the European Parliament and of the Council establishing an Agency for the Cooperation of Energy Regulators.

<sup>28</sup> EP's first reading from July 2008 proposes significant new decision-making powers and greater regulatory and financial independence (P6\_TA-PROV(2008)0296).

<sup>29</sup> European Council Brussels 8-9 March 2007, Presidency Conclusions, 7224/1/07 Rev 1, Annex I.

<sup>30</sup> European Council Brussels 15-16 October 2008, Presidency Conclusions, 14368/08.

<sup>31</sup> Brussels, 17.11.2005, COM(2005) 576 final.

<sup>32</sup> Brussels, 12.12.2006 COM(2006) 787 final.

Chapter<sup>33</sup>), the EU has limited power to sustain a strong common EU policy in the field of security of supply.

Achieving diversification in the energy mix requires identification of the sources of energy available in sufficient quantities to make a real impact on consumption and the EU energy imports and identification of the prices the EU is willing to pay for these secondary energy sources. But, it is also a question of reaching a certain level of coordination between Member States and of balancing the environmental consequences of changes in the energy mix.

IEA chief Nobuo Tanaka recently stressed that bilateral deals may threaten a common EU security<sup>34</sup>, and the EP has suggested establishing a new 'High Official' ensuring better coordination as well as a treaty basis for a common foreign-energy policy<sup>35</sup>. Support for a more unified stance and diversification of energy supplies is also expressed in various EP resolutions on Russia and energy issues<sup>36</sup>.

### 1.1.3 Diversification in energy sources

Diversification first of all means alternative energy sources. The central issue is to identify ways of obtaining a better and more versatile energy mix that may reduce exposure to geopolitical changes<sup>37</sup>. Today approximately 80% of our energy use is based on oil, gas and coal. The risks of climate change emphasises the importance of moving towards low-carbon energy sources.

In 1997 the EU set a target of 12% of (gross inland) energy consumption from renewables by 2010. Since then a EU27 20% renewables target by 2020 has been agreed and the target is an effort towards diversification (see also briefing for Working Group 2: Energy innovation and sustainable development). Today, the EU overall renewables share stands at approximately 9% of (gross final) energy consumption<sup>38</sup>. In 2006 18% of the *global* final energy consumption came from renewable energies (biofuels 0.3%)<sup>39</sup>.

The EU Renewables Directive in place since 2001, aimed at increasing EU's share of *electricity* produced from renewables to 21% by 2010<sup>40</sup>, thus contributing to reaching the overall target. However, it became clear that only 18-19%<sup>41</sup> would be achieved (effectively the share was 14.6% in 2006, down from 15.2% in 2001<sup>42</sup>). In January 2008, a revision of the Directive proposed, that to achieve the targets, every country will be required to increase its share of renewables by 5.5% from 2005 levels, with the remaining increase calculated on the basis of per capita GDP. EP's draft first reading report<sup>43</sup> (voted in ITRE in September) on the Directive, generally proposes mandatory interim targets to ensure targets are met.

In the transport sector, foreseen routes of diversification include biofuels. The transport sector is almost 98% dependent on oil, making it highly vulnerable to oil price fluctuations and supply disruptions, as amply illustrated by the suffering of air transport companies during the last price hike. The development of sustainable biofuels produced both in Europe or in tropical countries, can be a way of diversifying sources, while giving developing countries and European companies new investment opportunities while reducing the supply tensions in the oil markets. The use of biofuels from third countries in line with WTO agreements would

<sup>33</sup> Energy chapter introduced in the Lisbon Treaty under Title XX, Article 176 A.

<sup>34</sup> EUObserver, 05.09.2008.

<sup>35</sup> September 2007 EP resolution Towards a common European foreign policy on energy.

<sup>36</sup> EU economic and trade relations with Russia, 19 June 2007; The internal gas and electricity market, 10 July 2007; A European strategy for sustainable, competitive and secure energy, 14 December 2006.

<sup>37</sup> The issue is in part discussed in the Energy Green Paper key issue (6) on a better combination on the energy consumption.

<sup>38</sup> The share was in 2006 7.1% for EU27 as calculated by gross inland consumption, According to Eurostat the share of RES to final energy consumption (incl. branch for electricity and heat, with normalised hydro contribution) was 9.2% in 2006, EU Energy in figures 2007/2008, Eurostat, May 2008. The Commission refers to a figure of 8.5% in its communication 20-20 by 2020, likely to be the adjusted 2005 figure).

<sup>39</sup> Renewables global status report 2007 [http://www.ren21.net/pdf/RE2007\\_Global\\_Status\\_Report.pdf](http://www.ren21.net/pdf/RE2007_Global_Status_Report.pdf)

<sup>40</sup> Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market. The directive originally indicated 22%, but this was changed to 21% with the accession of Rumania and Bulgaria.

<sup>41</sup> EC Communication on The share of renewable energy in the EU, COM(2004) 366, of 26.5.2004.

<sup>42</sup> EU Energy in figures 2007/2008, Eurostat, May 2008.

<sup>43</sup> COD/2008/0016 Turmes (Greens/EFA, LU) for ITRE, based on COM(2008)19 of 23.1.2008.

naturally not reduce EU's dependency on import and their current co-use with traditional fuels also minimises their contribution to security of supply.

The newly proposed Renewables Directive includes an objective of 10% share in biofuels use in transport fuel consumption. The EP in its draft report advocates strict sustainability criteria and proposes to define a hierarchy of biomass origin & technology. The target of 10% biofuels is to be replaced by a target of EU final consumption of 5% in 2015, 10% in 2020 for renewable energy (not just biofuels) in transport in conjunction with a mandatory 20% improvement in energy efficiency. In 2005 the share of biofuels in total fuel consumption in transport was 1%<sup>44</sup>. (For more on the proposed Renewables Directive see also WG 3 note on EU Climate Change Policies).

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<sup>44</sup> Eurostat, online energy data, from 7.11.2007.

Nuclear energy makes up 14% of the EU energy consumption and a substantial 30% of EU electricity consumption. As the use of nuclear energy remains a sensitive issue related to the energy mix of Member States, both the EC and EP have been cautious in their dealings with the subject. However, nuclear energy has come back into the political debate and in 2007 the European Nuclear Energy Forum and the High Level Group on Nuclear Safety and Waste Management were established<sup>45</sup>. The EC has recommended<sup>46</sup> that reductions in the level of nuclear energy should be offset by introduction of other low-carbon energy sources. Commissioner Piebalgs recently said that nuclear energy is a clear option because of its characteristics, namely that it is carbon free, has low price vulnerability, is a source of diversification, and the EU has strong technological leadership in the field<sup>47</sup>. The Commissioner also noted that more than 50% of the EU electricity generation capacity needs to be replaced by 2030, representing €900 billion of potential investments. Within the EU new plants are being built in Finland and France. There are further projects for units in Bulgaria, Slovakia and Romania. The UK and Italy have indicated new plans on nuclear power. A further security-related element in the development of nuclear applications in Europe are the challenges of adoption of common safety standards, management of radioactive waste and securing funding of long term costs.

#### 1.1.4 Diversifications in origins and transit routes

Diversification also means finding alternative supplies, i.e. establishing agreements with and importing energy from new suppliers (diversification of origins) and building new infrastructure to accommodate these new suppliers as well as establishing new supply routes from traditional suppliers (diversification of transit routes). Having more suppliers will spread the risks, and could enhance competition in the internal energy market and, in consequence, create better prices for European consumers.

Currently the EU imports almost 80% of Russian gas through Ukrainian pipelines. This is why the Baltic pipeline North Stream<sup>48</sup> has been identified as a priority by the EU, and it is also why the EU does not oppose the Gazprom-Eni led pipeline in the Black Sea, South Stream<sup>49</sup>, as it may reinforce the supply routes from the EU's main supplier. Commissioner Piebalgs has likewise indicated that if any investors would appear for the Yamal II<sup>50</sup> or Amber<sup>51</sup> pipelines, they would be given his support<sup>52</sup>. The Langeled pipeline opened in 2006/07 as the hitherto longest underwater gas pipeline feeding Norwegian gas to the UK<sup>53</sup>.

Algerian gas is currently following the Magreb-Europe gas pipeline to Spain and the Trans-Mediterranean pipeline to Italy. As for Russia, the development of additional pipelines is important, such as the development of Galsi<sup>54</sup> or Medgas<sup>55</sup>, which would be extended to France and Germany, and the Trans Saharan pipeline, between Nigeria and the Mediterranean coast, interconnected with the Algerian network (see also elaborating notes 'Les enjeux énergétiques en Méditerranée').

To limit EU's dependency on Russia, potential suppliers from the Caspian Sea region are being considered: Azerbaijan already supplied its first gas to Europe while Turkmenistan, Kazakhstan and Iraq have shown interest in selling gas to the EU, and Iran is further down the line another potential supplier. The new supply route for this gas would be the Nabucco

<sup>45</sup> ENEF was proposed in the 10.01.2007 Communication "An energy policy for Europe," endorsed by the European Council in March 2007 and inaugural meeting held in November 2007. The high level group was set up by Commission decision 2007/530/Euratom of 17.07.2007.

<sup>46</sup> Communication Energy for a changing world, COM(2008)30, 23.1.2007,

<sup>47</sup> Piebalgs address to the European Nuclear Energy Forum, 3.11.2008, Bratislava, speech/08/576.

<sup>48</sup> Offshore pipeline through the Baltic sea between Vyborg, Russia, and Greifswald, Germany.

<sup>49</sup> Would transport Russian natural gas to Italy 31 (billion cubic meters (bcm) of gas annually) – seen as rival to the Nabucco.

<sup>50</sup> Connects natural gas fields on the Yamal peninsula, Russia, with Germany. Construction of second leg is under discussion.

<sup>51</sup> Gas supply route from Russia through Latvia and Lithuania.

<sup>52</sup> Blog of Piebalgs, <http://blogs.ec.europa.eu/piebalgs/the-complex-meaning-of-diversification/>, 26 September 2008.

<sup>53</sup> Partners in Ormane Lange License group are Hydro, Shell, Petoro, Statoil, BP and ExxonMobil. The pipeline is 1,200 km long, and can deliver 20-25 billion cbm gas/year. The project cost £1.7bn. Opened 1 October 06 and full scale a year later. New pipeline to deliver a fifth of UK gas. 24.06.08, BBC news; New pipeline may stem gas fears, 11.09.06, BBC News.

<sup>54</sup> Running from Hassi R'mel in Algeria to mainland Italy, through Sardinia. It is expected to become operational by 2012.

<sup>55</sup> From Hassi R'mel, Algeria to Almeria, Spain. Construction is underway and line foreseen operational in 2009.

pipeline. The pipeline will have capacity to supply a large quantity<sup>56</sup> of gas and has been backed by the EU with a grant for 50% of the cost of the feasibility study. Total development costs are now estimated at €7.9 billion<sup>57</sup>. This corridor has so far represented the most promising option for diversifying gas supply to the EU, avoiding Russia.

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<sup>56</sup> Initially (2013) transmission deliveries are expected to be between 4.5 and 13 billion cubic meters (bcm) per annum. The transmission volume is expected to reach 31 bcm per annum around 2020.

<sup>57</sup> EU natural gas pipeline project gets first order, Herald Tribune, June 11, 2008.

However, the conflict in Georgia in August has made the Georgian section of a corridor considerably less secure (see also elaborating notes 'the EU's security of energy supply: the situation after the war in Georgia' and 'nucléaire iranien civil/militaire'). Naturally the different pipeline projects will help diversification but will to some degree also be in competition with each other.

A further potential source of supplies comes from terminals that can re-gasify liquid gas (LNG) in ports, so that tankers from other parties may supply the EU with gas. The role of LNG is becoming ever more important to the EU and several investments in LNG terminals are being planned or under way. Rules for third party access to LNG terminals still need to be made coherent and transparent, but the diverging application of those rules by Member States should be overcome by proposed new measures for the functioning of the gas market<sup>58</sup>. The European Council recently stressed the need to reinforce and increase critical infrastructure such as LNG terminals as a priority area for reinforcing the Union's security of supply<sup>59</sup>.

#### 1.1.5 Impact of measures for EU market liberalisation and reciprocity clause

In the discussions of the "third energy package" from September 2007<sup>60</sup> ownership unbundling is under intense debate. The outcome will have an impact on management of transmission networks and investment policies not only for EU businesses but also for third-country owned companies active on the EU market. Indeed, the principle of reciprocity to third countries concerning market access requirements and ownership rules called for by the EP<sup>61</sup> has been proposed by the EC and confirmed by the Parliament in its first reading (the so-called 'Gazprom clause').

In the first reading of the proposed directive, Parliament finally rejected the Independent System Operator (ISO) option, but endorsed the creation of Independent Transmission System Operators (ITOs), allowing a gas supply company to retain the ownership of pipelines, if management of them is in the hands of a transmission system operator with "effective decision-making rights", for which there should be safeguards. The same EP resolution endorsed Article 7a, which excludes third-country parties from controlling transmission systems or transmission system operators, unless an agreement on a common framework is concluded. Clarification on the application of such clauses still needs to be provided as well as on their impact on the third country suppliers. Article 7a is controversial among EU Member States with bilateral deals with Russia to secure their long-term gas supplies.

#### c. Reducing energy consumption by promoting energy efficiency

Naturally a central element in reducing risks of energy supply is to reduce the overall level of energy consumption. The less we consume the less dependent the EU will be on foreign suppliers. On 22 June 2005, the EC published a Green Paper on Energy Efficiency<sup>62</sup> putting forward a series of ideas for discussion that could save Europe 20% in energy consumption by 2020 and save 60 billion euro per year on its energy bill. Housing and transport are the sectors highlighted as those where the saving potential is the greatest.

The Energy Efficiency Action Plan adopted in October 2007<sup>63</sup> outlines a framework of policies and measures to intensifying the process of realising the 20% estimated savings potential. The Plan lists a range of cost-effective measures to be initiated either immediately or gradually over the Plan's six year period, including energy efficiency labelling standards, building performance requirements, improving efficiency of power generation and distribution, cars fuel efficiency, facilitating financing of energy efficiency investments for SMEs and Energy Service Companies and a coherent use of taxation. Many of these measures are now

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<sup>58</sup> Gas proposal of the third energy package: Common rules for the internal market in natural gas COM(2007)0529 and access conditions to the gas transmission network COM (2007)0532

<sup>59</sup> European Council Brussels 15-16 October 2008, Presidency Conclusions, 14368/08.

<sup>60</sup> See [http://ec.europa.eu/energy/electricity/package\\_2007/doc/2007\\_09\\_19\\_explanatory\\_memo\\_en.pdf](http://ec.europa.eu/energy/electricity/package_2007/doc/2007_09_19_explanatory_memo_en.pdf).

<sup>61</sup> September 2007 EP resolution Towards a common European foreign policy on energy, called for appropriate measures to prevent uncontrolled investment by state-owned foreign companies in the EU's energy sector, in particular the gas and electricity transmission networks and to closely monitor the observance of these measures.

<sup>62</sup> Green Paper on Energy Efficiency Doing more with Less, COM(2005) 265 final (June 2005).

<sup>63</sup> Communication from the Commission on an Action Plan for Energy Efficiency: Realising the Potential, Brussels, 19.10.2006 COM(2006)545 final.

in preparation<sup>64</sup> or have been proposed and are undergoing consideration in Council and EP<sup>65</sup>.

### Upcoming proposals & events

- The EC is expected to publish its 2nd Strategic Energy Review<sup>66</sup> on 12 November 2008, with a focus on energy security. The EP ITRE Committee will prepare an own-initiative report (Laperrouze, ALDE, FR) on the review. The review is expected to be accompanied by several specific initiatives (review of the Energy Performance Building Directive, review of the Oil Stock Directive, update of Illustrative Nuclear Programme, etc.).
- A summit meeting between the EU and Russia will be held on 14 November. On 10 November the EU foreign ministers decided that the EU will resume negotiations for a new partnership agreement (Lithuania objecting to this)<sup>67</sup>. The talks were abandoned after the outbreak of the Georgia conflict. The agenda for the EU-Russia summit has not yet been finalised, but one of the topics will be energy security in the Baltic States, according to President Sarkozy<sup>68</sup>. The issue is particularly important for Lithuania, whose only nuclear power plant will be shut down at the end of 2009 on EU orders and which fears that it will almost entirely dependent on Russian energy supplies thereafter.
- The EP has planned for the energy and climate package<sup>69</sup> to be voted in the December I plenary - a very tight schedule. The Renewables Directive is to be voted in December II plenary. The European Council has requested the EC and Presidency to work intensively on the issue with a view to the European Council deciding responses in December 2008.
- OPEC will meet again in December to discuss oil production levels.
- The European Council has committed itself to take stock of progress on energy security in its spring meeting in March 2009, with a view to adopting decisions<sup>70</sup>.
- It is expected, that that the 2nd Strategic Energy Review will go to the spring European Council in March 2009, and that the review will give the basis for a new Energy Action Plan (2010-2013). Elements of security of energy supply contained in the EC review spans inter alia international partnerships, 3rd country agreements, EU-Russia partnership, the Southern Gas Corridor, emergency oil stocks and infrastructures.
- The EU will be meeting the Caspian Sea countries and transit countries during the Czech Presidency in the spring of 2009<sup>71</sup>.

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<sup>64</sup> As indicated elsewhere in the note some proposals are foreseen for 12 November (Energy Building Performance Directive).

<sup>65</sup> COM(2007)0018 Specification of petrol, diesel and gas-oil: Directive introducing a mechanism to monitor and reduce greenhouse gas emissions from fuels (road transport and inland waterway vessels) EP first reading A6-0496/2007; COM(2007)0856 Reduction of CO2 emissions from light-duty vehicles: setting emission performance standards for new passenger cars; COM(2005)0634 Energy efficiency in transport: promotion of clean and energy efficient road transport vehicles. EP report: T6-0509/2008; COM(2008)0399 Ecodesign requirements for energy related products; COM(2006)0576 Energy efficiency products: office and communication technology equipment, labelling programme Energy Star (recast Reg. 2422/2001/EC).

<sup>66</sup> COM(2008)0312.

<sup>67</sup> EU resumes Russia talks, isolating Lithuania, EUobserver, 11.11.2008.

<sup>68</sup> EU confirms Russia summit, EuropeanVoice 16.10.2008.

<sup>69</sup> Proposal on Renewable Energy Sources, the ETS proposal, Burden Sharing proposal (efforts to reduce their greenhouse gas emissions), emission performance on new passenger cars, geological storage of carbon dioxide, European Strategic Energy Technology plan.

<sup>70</sup> European Council Brussels 15-16 October 2008, Presidency conclusions, 14368/08.

<sup>71</sup> Idem note 70.

## Working group 2: Energy Innovation and Sustainable Development

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## 1. Energy Innovation: addressing the structural challenges

Rapid growth in global energy demand coupled with growing concerns about energy security and the environment, have raised questions about the sustainability of the current energy system. The development and deployment of innovative, low-cost, low-carbon energy technologies, energy efficiency (EE) and renewable energy (RE) are needed to reduce emissions, to help create new markets for EU industry and to secure adequate level of supply.

The energy innovation process, from conception to market penetration, suffers from structural weaknesses and barriers:

- long lead times to mass market due to the scale of the investments needed;
- technological and regulatory inertia inherent in existing energy systems;
- 'locked-in' carbon-based infrastructure investments, dominant actors, imposed price caps;
- changing regulatory frameworks and network connection challenges;
- competition from fossil fuels, where the price does not include the environmental and social costs;
- restricted market take-up for some new energy technologies due to social acceptance issues;
- often additional up-front integration costs to fit into the existing energy systems; and
- legal and administrative burdens.

In sum, there may be neither a natural market appetite nor a short-term business benefit for such technologies. This market gap between supply and demand is often referred to as the 'valley of death' for low carbon energy technologies.

The common assertion that governments should only set general frameworks to encourage sustainable innovations and avoid "picking winners" is being challenged on a number of grounds.<sup>72</sup> Firstly, the resources governments can devote to sustainable energy innovation are limited and risk to be spread too thinly. Secondly, carbon markets have yet to demonstrate that they are strong enough to promote low carbon innovation and markets may not bring fast enough needed changes. In addition, high carbon prices may prove not to be sufficient to develop technologies that are not close to commercial status.

Against this background, in addition to making use of 'market pull' instruments such as the EU Emission Trading Scheme, the Commission (EC) has argued that public intervention to bring clean technologies onto the market is both necessary and justified<sup>73</sup>. A 'technology push' approach is currently also championed by the US, which has put in place large-scale R&D programmes.

### 1.1 EU's Strategic Energy Technology Plan

To strengthen the overall effort in Europe to accelerating innovation in low carbon technologies, a European Strategic Energy Technology Plan (SET-Plan) was presented by the EC in November 2007<sup>74</sup>. The plan identifies key EU technological challenges for the next 10 years (see box 1) and proposes to deliver: (i) a new joint strategic planning<sup>75</sup>, (ii) a more effective implementation, through the launch of new European Industrial Initiatives (EII), (iii) an increase in resources, (iv) a new and reinforced approach to international cooperation.

#### Box 1: Key EU technology challenges for the next 10 years to meet the 2020 targets:

- Make second generation biofuels competitive alternatives to fossil fuels, while respecting the sustainability of their production;
- Enable commercial use of technologies for CO2 capture, transport and storage through demonstration at industrial scale, including whole system efficiency and advanced research;
- Double the power generation capacity of the largest wind turbines, with off-shore wind as the lead application;
- Demonstrate commercial readiness of large-scale Photovoltaic (PV) and Concentrated Solar Power;
- Enable a single, smart European electricity grid able to accommodate the massive integration of renewable and decentralised energy sources;
- Bring to mass market more efficient energy conversion and end-use devices and systems, in buildings, transport and industry, such as poly-generation and fuel cells;
- Maintain competitiveness in fission technologies, together with long-term waste management solutions;

Source: SET-Plan COM (2007)723

<sup>72</sup> Setting priorities in Energy Innovation Policy: lessons for the UK (J. Watson October 2008 - Cambridge, Mass.).

<sup>73</sup> COM(2007)723 SET-Plan EC Communication "Towards a low carbon future".

<sup>74</sup> Idem note 2.

<sup>75</sup> Through the establishment of a Steering Group on Strategic Energy Technologies and organisation of European Energy Technology Summit in the first half of 2009.

In July 2008 the EP welcomed the SET-plan<sup>76</sup> and stated that a European energy technology policy with adequate financial support is fundamental to achieving the EU energy and climate change objectives. The EP also believes that to achieve the targets it is vital to reduce the cost of green energy and to boost innovation in the energy sector.

The EP resolution strongly supports all the proposed EII (see box 2). In particular, the EP calls for biofuels research to be intensified and stresses the importance of developing large-scale biomass to gas conversion to produce hydrogen and liquid synthetic fuels for sustainable transport technologies. The EC is called upon to investigate the possibility of extending the EIIs to other sectors with significant emissions reduction potential such as cogeneration, hydrogen, the construction and housing sector, heating and cooling systems, better energy storage and distribution infrastructures and interconnection of networks. The EP calls on the EC to facilitate the realisation of up to 12 proposed CCS full-scale demonstration projects within the EIIs.

## 1.2 Current EU innovation initiatives

European Technology Platforms (ETP) were first proposed in December 2002<sup>77</sup>. Their aim is to bring together industrial and academic research communities in specific technology fields with a significant economic and societal impact, to coordinate their research agenda and tailor a common long-term strategic plan for R&D, in a “strategic research agenda” (SRA). The SRA aims to mobilise a critical mass of national, public and private resources and to overcome barriers to the development, deployment and use of new technologies.

In December 2007, 34 ETPs representing a wide range of technological fields were up and running, including ETPs for wind energy, for the electricity networks of the future, for hydrogen and fuel cells, for photovoltaics, for zero emission fossil fuel power plants and for biofuels.<sup>78</sup>

Building on the hydrogen and fuel cells ETP, the Joint Technology Initiative (JTI) on fuel cells and hydrogen (FCH), was established in May 2008.<sup>79</sup> The FCH JTI will run until 2017 and will drive the technology towards commercialisation in the next decade. Between 2008 and 2017, the JTI will have a budget of €1bn with investment shared by its two founding members, the EU (via FP7) and Industry Grouping (NEW IG).

Climate change and energy have been identified as primary areas of focus of the European Institute of Technology, the work of which aims at contributing to the acceleration of commercialisation of innovative technologies.

### Box 2: European Industrial Initiatives proposed in the SET-Plan

- *European Wind Initiative*: focus on large turbines and large systems validation and demonstration (relevant to on and off-shore applications).
- *Solar Europe Initiative*: focus on large-scale demonstration for photovoltaics and concentrated solar power.
- *Bio-energy Europe Initiative*: focus on 'next generation' biofuels within the context of an overall bio-energy use strategy.
- *European CO2 capture, transport and storage initiative*: focus on the whole system requirements, including efficiency, safety and public acceptance, to prove the viability of zero emission fossil fuel power plants at industrial scale.
- *European electricity grid initiative*: focus on the development of the smart electricity system, including storage, and on the creation of a European Centre to implement a research programme for the European transmission network.
- *Sustainable nuclear fission initiative*: focus on the development of Generation-IV technologies

Source: SET-Plan COM (2007)723

<sup>76</sup> EP resolution of 9 July 2008 on the European Strategic Energy Technology Plan (2008/2005(INI)).

<sup>77</sup> COM (2002)714 “Industrial Policy in an enlarged Europe”.

<sup>78</sup> “Evaluation of the European Technology Platforms” - Final Report for DG Budget (EC) by Idea Consult (December 2007).

<sup>79</sup> Council Regulation setting up the Fuel Cells and Hydrogen Joint Undertaking (8541/08).

## 2. Financing energy innovation

### 2.1 Public funding mechanisms

Public and private energy research budgets in the EU have declined substantially since peaking in the 1980s in response to the energy price shocks, and this has led to an accumulated under-investment in energy research capacities and infrastructures.<sup>80</sup> If EU governments invested today at the same rate as in 1980, the total EU public expenditure for the development of energy technologies would be four times the current level of investment of around €2.5bn per year.<sup>81</sup> This declining trend can be observed also in the US<sup>82</sup> although the US's annual allocations are substantially higher than those of the EU.

The Seventh Framework Programmes (FP7) for Research and Development (2007-2013)<sup>84</sup>; the Intelligent Energy Europe (IEE); and the Entrepreneurship and Innovation Programmes under the Competitiveness and Innovation Framework Programme (CIP)<sup>85</sup> are the main sources for EU funding of technological innovation projects.

On 27 October 2008, a European Energy Research Alliance (EERA)<sup>86</sup> was established as one of the outcomes of the SET-Plan. Leading research institutes have committed to use their combined annual R&D budget (>€1.3bn) to strengthen and optimise EU energy research capabilities.

Key research areas promoted include wind, solar energy, second-generation biofuels, smart grids and carbon capture and storage. The first joint EERA programmes are foreseen to be launched in 2009. Cooperation is due to expand and intensify, as other research organisations are welcome to join once the project is properly up and running.

Further resources are required to finance the proposed EII and the EERA. A EC Communication on financing low carbon technologies is expected in early 2009 and will address resource needs and sources, examining all potential avenues to leverage private investment, including private equity and venture capital, enhance coordination between funding sources and raise additional funds.

#### Box 3: Budgets dedicated to energy research and innovation

<b>EU</b>	<ul style="list-style-type: none"><li>• €886m/year under FP7 (€574m/year under FP6)<ul style="list-style-type: none"><li>- non-nuclear energy research (RE and EE) €168m/year (19%)</li><li>- nuclear research 40%</li></ul></li><li>• €730m over 2007-2013 under "Intelligent Energy Europe"</li><li>• €30m over 2007-2013 for "eco-innovation" under "Entrepreneurship and Innovation"</li></ul>
<b>US</b>	<ul style="list-style-type: none"><li>• \$4.4bn for 2007</li><li>• \$5.3bn per year for 2008 and 2009</li></ul>
<b>OECD</b> <sup>83</sup>	<ul style="list-style-type: none"><li>• \$9.6bn in support to R&amp;D on energy in 2005, of which:<ul style="list-style-type: none"><li>- \$1.1bn on energy efficiency and conservation</li><li>- \$1.1bn on renewables</li><li>- \$1bn on fossil fuels</li><li>- \$3.9bn on nuclear</li></ul></li></ul>

<sup>80</sup> Idem note 2.

<sup>81</sup> Idem note 2.

<sup>82</sup> US energy research and development: Declining investment, increasing need, and the feasibility of expansion Gregory F. Nemet, D M. Kammen, University of California, Berkeley 2007.

<sup>83</sup> OECD World Environment Outlook 2030.

<sup>84</sup> Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-13).

<sup>85</sup> Decision 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme(2007-2013).

<sup>86</sup> <http://www.eera-set.eu/index.html>.

In particular, it will examine the opportunity of creating a new European mechanism/fund for the industrial-scale demonstration and market replication of advanced low carbon technologies and will consider the costs and benefits of tax incentives for innovation.

The EP SET-plan resolution pointed out that the plan should not be financed through the reallocation of funds made available for energy under FP7 and CIP, and that at least an additional €2bn per year should be allocated as of 2009 to provide adequate financing and support for new low carbon and zero carbon technology R&D, demonstration and commercialisation, independently from FP7 and CIP.

## 2.2 Private financing mechanisms

Recent studies show that there is still room for substantial growth in private capital investments in European clean energy<sup>87</sup>. The financial sector, including private equity and venture capital, needs to adapt their risk profiles to invest more in potentially high-growth SMEs and spin-offs active in the field of low carbon technologies.

The European Investment Bank is increasingly dedicating resources to energy projects (€7bn/year for 2009 and 2010) and has reinforced its contribution in the areas of RE and EE. It aims to develop less mature markets in and outside the EU and to favour the deployment of less-developed RE sources (such as solar power, biomass or biofuels)<sup>88</sup>. Initial results from the Risk Sharing Finance Facility established in 2007<sup>89</sup> for financing research and innovation, confirm that the EIB is opening up wider financing opportunities for research and demonstration projects in the RE and EE sectors.

## 3. Policy measures for bringing innovative energy technologies on the market

Turning existing and available technological or systems innovation (for instance in buildings, industry and transport sectors) into business opportunities can bring significant improvements in energy efficiency conversion, supply and end-use. These EE improvements represent the largest and least costly potential energy savings. Next in the hierarchy of importance come measures to substantially de-carbonise power generation - this the IEA advocates could be achieved through a combination of RE, nuclear power, and use of CCS at fossil fuel plants.<sup>90</sup>

Efforts to develop and deploy new and improved energy technologies that can support sustainable energy systems are undertaken through different policy mechanisms but need to be enhanced. Further measures are needed to allow more significant systems innovation in the different sectors of the economy.

### 3.1 Energy efficiency and energy conservation

In 2005, the Green Paper on Energy Efficiency<sup>91</sup> pointed to the fact that the EU could save at least 20% of its present energy consumption in a cost-effective manner, equivalent to €60bn per year. In 2006, the EP promoted a target of at least 20% improvements in EE by 2020<sup>92</sup> while the Council in 2007 only proposed it as an objective to reach by 2020.<sup>93</sup>

Nevertheless, the EU Energy Efficiency Action Plan adopted in October 2007<sup>94</sup> outlines a framework of policies and measures to

#### Box 4: EIB targets for EE & RES

- Annual target of min. €800m lending to RE projects
- 50% of lending to electricity generation associated with RE technologies
- Raise financing share of total costs for projects from 50% to 75%, for “emerging RE technologies” and investments contributing significantly to EE
- Update of the selection criteria for RE technologies
- Develop financial instruments for smaller-scale investments
- Introduce a systematic review of EE issues when assessing projects

<sup>87</sup> ‘Global Trends in Sustainable Energy Investment 2007’, United Nations Environment Programme and New Energy Finance Ltd.

<sup>88</sup> EIB Corporate Operational Plan 2008-2010 <http://www.eib.org/about/publications/corporate-operational-plan.htm>.

<sup>89</sup> <http://www.eib.org/about/press/2007/2007-050-european-commission-and-eib-launch-new-instrument-to-finance-research-and-innovation.htm>.

<sup>90</sup> IEA : Energy technology perspectives 2008 – Scenarios and strategies to 2050.

<sup>91</sup> “Doing More with Less” (COM(2005) 265 final of 22 June 2005).

<sup>92</sup> EP resolution on Energy efficiency or doing more with less - Green Paper, June 2006, P6\_TA(2006)0243.

<sup>93</sup> European Council Conclusions March 2007 (7224/1/07).

<sup>94</sup> “Action Plan for Energy Efficiency: Realising the Potential” COM(2006)545 final.

intensify the process of realising the 20% estimated savings potential by 2020. It proposes 10 priority actions to be introduced over a six-year period. Measures include labelling standards, building performance requirements, improving efficiency of power generation and distribution, cars fuel efficiency, facilitating financing of EE investments for SMEs and Energy Service Companies and a coherent use of taxation.

At the national level, Member States are required by the Energy Services Directive<sup>95</sup>, to adopt an overall national indicative energy savings target of 9% by 2016, to be reached by way of energy services and other EE improvement measures. In June 2007, 17 Member States submitted their first National Energy Efficiency Action Plans, showing how they intend to reach the 9% target.

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<sup>95</sup> Directive 2006/32/EC on energy end-use efficiency and energy services.

A first review of the submitted NEEAP<sup>96</sup> indicated a gap between the political commitment and the proposals to face the challenges. However, 5 Member States adopted savings targets going beyond the minimum indicative target and several Member States have set out comprehensive action plans for demonstrating the exemplary role of the public sector. Numerous financial and fiscal incentives (in particular in the housing and construction sector or for purchase or production of energy efficient equipment) are being put forward.

### 3.1.1 Buildings sector

The buildings sector accounts for 40% of the EU's energy requirements, and offers the largest single potential for EE. According to the EC more than one-fifth of the present energy consumption and up to 30-45 Megatons of CO<sub>2</sub>/year could be saved by 2010 by applying more ambitious standards to new buildings and when refurbishing existing buildings.<sup>97</sup>

The aim of improved EE has previously been set out in several existing legal instruments (boilers, construction products and SAVE Directives)<sup>98</sup>. Building on those, a directive on the energy performance of buildings<sup>99</sup> came into effect in 2006. It provides a common methodology for calculating the energy performance of buildings and for creating minimum standards of energy performance in individual Member States. The directive applies to new buildings and to existing buildings subject to major renovations.

The recasting of the directive, expected in November 2008 is likely to extend the scope to cover a most of the 72% of buildings in the EU that fall below the current 1000m<sup>2</sup> threshold in the directive<sup>100</sup>, expanding the role of the public sector so that it may lead by example and reinforce the role of energy performance certificates required. The revised proposal should also include measures to facilitate Member State financing of investments leading to energy performance improvements in the building sector.

Existing technological developments could contribute to the widespread construction of buildings that far exceed the EE requirements set by policy-makers today. Urban multi-residential housing developments that are best-practices not only from an energy savings point of view, but also from an urban planning and social organisation perspective have been developed in the EU.<sup>101</sup> These projects have achieved greater sustainability by using a combination of local public policy, planning, design and technology, whereby the use of "traditional" energy saving measures such as better insulation is only part of the solution. Large companies have also been taking interest in the sector and have developed materials, systems and other technologies to increase EE.<sup>102</sup> Advances in RE technologies, such as a "solar dye" for example, can further contribute to the "greening" of buildings.

### 3.1.2 Industry sector (product policies and ICT)

Apart from the user's behaviour, there are two complementary ways of reducing the energy consumed by products: a) labelling to raise awareness of consumers on the real energy use in order to influence their buying decisions and b) EE requirements imposed to products from the early stage on the design phase.

The Eco-Design Directive<sup>103</sup> establishes a framework for setting eco-design requirements, such as EE requirements, for all energy-using products in the residential, tertiary and industrial sectors. The directive does not introduce directly binding requirements for specific products, but defines conditions and criteria for setting requirements regarding environmentally relevant product characteristics and allows them to be improved quickly and

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<sup>96</sup> Communication from the Commission on a first assessment of national energy efficiency action plans as required by Directive 2006/32/EC on energy end-use efficiency and energy services - Moving forward together on energy efficiency (COM/2008/0011).

<sup>97</sup> [http://ec.europa.eu/energy/demand/legislation/buildings\\_en.htm#Overview](http://ec.europa.eu/energy/demand/legislation/buildings_en.htm#Overview).

<sup>98</sup> Boiler Directive (92/42/EEC), Construction Products Directive (89/106/EEC) and buildings provisions in the SAVE Directive (93/76/EEC).

<sup>99</sup> Directive 2002/91/EC on the energy performance of buildings.

<sup>100</sup> The EC on 18 September 2008 orally modified the above by specifying that the 1000m<sup>2</sup> threshold will be lowered or *possibly dropped altogether*; moreover the revision was said to now also include a *benchmarking system* which can further best practise exchange. Speech by Deputy Director General for DG TREN in EP at Conference on "Towards a European Policy for Sustainable Housing?".

<sup>101</sup> Vaubanexternal development in Freiburg, Germany, and the BedZED development in the south of London.

<sup>102</sup> <https://buildingsolutions.honeywell.com/Cultures/en-US/>.

<sup>103</sup> Directive 2005/32/EC establishing a framework for the setting of ecodesign requirements for energy-using products.

efficiently. In principle, the Directive applies to all energy using products (except vehicles for transport) and covers all energy sources.

A revision<sup>104</sup> of the Eco-design Directive is currently under discussion, and proposes to extend the scope to cover other energy related products than energy-using products. The resulting directive is seen as the essential building block for an integrated sustainable environmental product policy, complemented by the initiatives on labelling<sup>105</sup> and other incentives such as greening public procurement<sup>106</sup> and reducing taxation for green products.<sup>107</sup>

While CO<sub>2</sub> emissions of the digital technology industry are on the increase and are responsible for 2% of global emissions (the same share as the airline industry),<sup>108</sup> new technologies have also the potential to help reduce energy consumption. A EC Communication aiming to raise awareness and stimulate an open debate between stakeholders on potential impact of ICT on EE was put forward in May 2008<sup>109</sup>. It identifies 3 priority areas: (i) fostering research into ICT based solutions and stimulate their take-up, (ii) ICT industry to lead by example, (iii) encourage structural changes to fully realise the potential for instance in business processes and services. A further communication is expected in 2009 quantifying the potential and identifying possible actions.

### 3.1.3 Transport sector

1. Emissions from the transport sector in the EU-27 have risen by 26% from 1990 to 2005. Road transport accounts for approximately ¼ of total energy consumption of the EU.<sup>110</sup> The potential for reducing vehicle emissions and energy savings is substantial, but technologies needed remain more expensive than conventional vehicle manufacturing technologies.

2. With car manufacturers expected to miss their 2008 voluntary commitment to reduce CO<sub>2</sub> emissions, legislation is under adoption<sup>111</sup> requiring them to cut the average CO<sub>2</sub> emissions of new cars by 18%, from current levels of around 160g/km to 130g/km by 2012, by improving vehicle technology. A further 10g/km reduction is expected to come from improvements in other areas, including tyres, fuels, air-conditioning and eco-driving. Negotiations between EP and Council are still ongoing on the proposed legislation and EP's first reading vote is expected for the December plenary. In October 2008, a first reading agreement was reached on a measure to promote clean and energy efficient road transport vehicles, by introducing energy consumption, CO<sub>2</sub> and pollutant emissions as mandatory award criteria into public procurement of vehicles.<sup>112</sup>

3. However, the current focus on vehicle and fuel technologies alone will be insufficient to offset the steady increase in passenger volumes and growth in freight transport. In the EC's 2001 White Paper for transport<sup>113</sup> about 60 measures were proposed to develop a transport system capable of shifting the balance between modes of transport and contribute to the sustainable development strategy. In 2006, urban transport was also put forward<sup>114</sup> as an area that can significantly contribute to achieving policy objectives of climate change, EE, congestion, use of alternative fuels, modal split, road safety, industrial competitiveness, environment, health and social inclusion. In 2006-2007 plans for making freight transport in

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<sup>104</sup> COM(2008)0399 proposal for a Directive to extend the scope of the Framework Eco-Design Directive to cover other energy related products than energy-using products.

<sup>105</sup> Regulation (EC) No 106/2008 of the European Parliament and of the Council of 15 January 2008 on a Community energy-efficiency labelling programme for office equipment (recast version), Community Ecolabel scheme COM(2008)0401.

<sup>106</sup> COM(2008) 400/2 EC Communication on Public procurement for a better environment.

<sup>107</sup> Council Conclusions 14 March 2008 - 7652/08.

<sup>108</sup> <http://www.gartner.com/it/page.jsp?id=503867>.

<sup>109</sup> COM(2008)241, of 13.05.2008 Addressing the challenge of EE through ICT

[http://ec.europa.eu/information\\_society/activities/sustainable\\_growth/docs/com\\_2008\\_241\\_1\\_en.pdf](http://ec.europa.eu/information_society/activities/sustainable_growth/docs/com_2008_241_1_en.pdf).

<sup>110</sup> Climate for a transport change. TERM 2007: indicators tracking transport and environment in the European Union, EEA Report No 1/2008, March 2008.

<sup>111</sup> COM(2007)856 Proposal for a Regulation of the European Parliament and of the Council setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO<sub>2</sub> emissions from light-duty vehicles.

<sup>112</sup> T6-0509/2008 EP Resolution on the proposal for a directive to promote clean and energy efficient vehicles.

<sup>113</sup> "European transport policy for 2010: time to decide" COM(2001) 370 final.

<sup>114</sup> COM(2005) 718 EC Communication "Thematic Strategy on the Urban Environment".

the EU more efficient and sustainable have been set forward<sup>115116</sup> to improve logistics and promote a more frequent use of cleaner modes such as rail and water transport.

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<sup>115</sup> COM(2006) 336 final, Freight Transport Logistics in Europe – the key to sustainable mobility.

<sup>116</sup> COM(2007) 607 final Freight Transport Logistics Action Plan.

## 3.2 Policy measures on Renewable Energy Sources

### 3.2.1 RE sources

Several of the RE technologies, especially wind energy, but also small-scale hydro power, energy from biomass, and solar thermal applications, are already economically viable and competitive but their potential has not yet been fully realised.<sup>117</sup> Measures to meet the target of 20% RE sources in energy consumption, to which EU leaders committed in March 2007, are being proposed in the revision of the Renewables Directive<sup>118</sup>, to be agreed upon before the end of the year. The directive is to be the main driver for those technologies for crossing the so-called "valley of death".

The Lead Market Initiative<sup>119</sup> is another initiative to encourage demand for RE by addressing high costs, low demand, market fragmentation as well as administrative and market barriers. RE is one of the identified six lead markets in which innovative solutions will be supported.<sup>120</sup> Policy areas for action identified by the EC in the creation of a lead market include: developing an anticipatory approach to product market regulation; stimulating and facilitating the timely development of standards by stakeholders; using public procurement in markets where public authorities can act as launch customers; improving and optimising IPR regimes; concerted actions between EU and Member States, and co-operation with industry.

### 3.2.2 Biofuels

The EC proposal for the Renewables Directive aims to raise the share of biofuels in transport to 10% by 2020. However, concerns have been raised that an increase in the production of biofuels based on current technologies, could have more negative implications for the environment than positive ones. Controversies include: the energy balance of biofuels production<sup>121</sup> (in particular ethanol); the real climate change reduction potential depending on land-use change, type of crop and end-use (transport or combined heat and power)<sup>122</sup>; impacts such as competition on land-use or raising commodity prices, etc. Biodiversity loss - especially in developing countries - is an important risk as forests and grasslands are cleared to plant the vast quantities of crops needed to make a significant contribution in the use of oil in transport.

The draft report voted in the ITRE Committee in September, proposes to introduce a 5% interim target by 2015, 20% of which must be met from "non-food and feed-competing" second-generation biofuels or from cars running on green electricity and hydrogen (40% by 2020). MEPs also support a "major review" of the whole EU biofuels promotion policy and of its social and environmental impact. On the binding "sustainability criteria" the draft report proposes that biofuels offer at least 45% carbon emission savings compared to fossil fuels – rising to 60% in 2015. The Council is on the other hand leaning towards a 35% CO<sub>2</sub> saving, which would then be scaled up to "at least 50%" in 2017.<sup>123</sup>

MEPs also insist additional social and environmental criteria are included to protect natural resources from both direct and indirect land use changes and to guarantee respect for human rights and adequate working conditions in biofuels plants, especially in developing nations.

## 3.3 Fossil fuels and clean coal technologies

Oil, coal and natural gas will remain the world's dominant sources of energy in the next decades, with resulting CO<sub>2</sub> emissions set to increase. As illustrated by a recent IEA report<sup>124</sup>, CO<sub>2</sub> capture and storage (CCS) is considered a particularly promising technology that could help reduce CO<sub>2</sub> emissions from fossil fuels.

<sup>117</sup> COM(2006) 848 EC Communication "Renewable Energy Roadmap".

<sup>118</sup> COM (2008)0019 Proposal for a Directive on the promotion of the use of energy from renewable sources.

<sup>119</sup> COM(2007) 860 EC Communication "A lead market initiative for Europe".

<sup>120</sup> Commission Staff working document Annex to COM(2007)860 EC Communication "A Lead Market Initiative for Europe" - Action Plan for renewable energies SEC(2007) 1729.

<sup>121</sup> <http://www.newrules.org/agri/netenergy.html>.

<sup>122</sup> Sustainable bio-energy: a framework for decision makers UN – Energy April 2007.

<sup>123</sup> Council Document 12157/08.

<sup>124</sup> IEA, October 2008 CO<sub>2</sub> Capture and Storage -- *A Key Carbon Abatement Option*, ISBN 978-92-64-041400.

As part of the "climate package" of January 2008, a proposal for an EU legal framework governing CCS was proposed<sup>125</sup>. In its draft report adopted in October, the EP called for the introduction of a ceiling on the amount of CO<sub>2</sub> EU power plants may emit beyond 2015.

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<sup>125</sup> COM(2008) 18 final Directive proposal on the geological storage of carbon dioxide.

The introduction of such "emissions performance standards" (EPS), already put in place in California, is backed by most experts as one of the incentives for industries to develop CCS.<sup>126</sup> Such a regulation would have a direct impact on Europe's existing and planned coal-fired power plants, the largest emitters of CO<sub>2</sub>.<sup>127</sup> EPS will be on the agenda in 2009 when the Integrated Pollution Prevention and Control Directive is expected for revision.

### 3.4 Nuclear energy

Nuclear energy currently has an important role to play in the energy mix of several EU countries and is considered as a low carbon technology that can contribute to reaching the climate change targets. A relative "renaissance" of nuclear is underway in the EU<sup>128</sup>.

The incentive effect of the FP6 and FP7 for nuclear research and training activities has maintained European nuclear research as a world leader, particularly in the field of controlled fusion with the establishment of joint undertakings set up for specific projects of fundamental importance: the Joint European Torus at Culham in 1978 and, more recently in 2006, the introduction of the European Legal Entity to implement the International Thermonuclear Experimental Reactor (ITER).

In 2007 a Sustainable Nuclear Energy Technology Platform (SNE-TP)<sup>129</sup> was launched aiming at coordinating research, development, demonstration and deployment in the field of nuclear fission energy. It gathers stakeholders from industry (technology suppliers, utilities and other users), research organisations including Technical Safety Organisations, universities and national representatives. Its "Strategic Research Agenda" will be agreed on 26th November 2008, with priorities addressing the deployment of Generation III reactors and the development of Generation IV systems, both fast neutron reactor systems with fuel multi-recycling for sustainable electricity-generating capability, and Very High Temperature Reactors for other applications of nuclear energy, such as production of hydrogen or biofuels. Important issues such as the safety of nuclear installations and the responsible management of waste will be also addressed.

## 4. International cooperation and technology transfer in the energy field

International cooperation, for example on research or the setting of international standards, is important to stimulate the global development, commercialisation, deployment and access to low carbon technologies. For emerging economies technology transfer is needed to ensure a steady energy supply for their rapid economic development. Energy demand is growing fast, particularly in India and China, and low-carbon technologies and technology avoiding negative impact on adaptation may help to ensure that the economic growth is not coupled with the high GHG emission growth.

The primary Community interest lies in helping developing and emerging economies develop and grow in a more sustainable manner, while building new market opportunities for the EU industry and ensuring effective collaboration in accessing and developing resources. Options include: (i) networking energy technology centres; (ii) setting up large-scale demonstration projects on technologies with the highest potential in those countries; (iii) increasing the use of innovative financing mechanisms, and (iv) reinforcing the use of the Kyoto Protocol mechanisms for investments in emissions reduction projects. A few examples of current status are presented below:

- In 2004, China and the EC adopted a five-year Energy Environment Programme (EEP), providing assistance to public authorities and funds for feasibility studies for clean technology projects.<sup>130</sup> In 2005 an Action Plans on Clean Coal Technologies and another on Industrial Co-operation on EE and RE were signed.<sup>131</sup> Between 2001 and 2006, the

<sup>126</sup> GlobeScan survey, sponsored by the European Climate Foundation.

<sup>127</sup> EURELECTRIC (EU electricity industry association): Views on New EU CCS Directive (3 Nov 2008).

<sup>128</sup> Two European Pressurized Reactors (EPR) being built in Finland and in France<sup>128</sup> and two further underway Finland is also starting the procedure for the possible construction of a 6<sup>th</sup> reactor, and France has announced it will construct a 2nd EPR.

<sup>129</sup> <http://www.snetp.eu>.

<sup>130</sup> More information about the Energy Environment Programme (EEP), see: [www.eep.org.cn/index.php](http://www.eep.org.cn/index.php).

<sup>131</sup> Towards a closer EU-China co-operation in the field of Energy, Speech 06/105, China-EU Energy Conference, 20 February 2006.

EU has spent approximately \$65m in support of clean energy in China.<sup>132</sup> Some experts, however, warn that the right balance should be found between technology transfer and IPR policies.<sup>133</sup> After a decade of absorbing foreign know-how, Chinese companies are increasingly able to deliver qualitative products and seem to be successful in their first steps in overseas markets in particular in the wind and solar energy sector.<sup>134</sup> Hence, the EU may want to protect its know-how as a tradable good that suits China's commercial and environmental needs.

- A high share of CDM projects is located in emerging economies (75% of Certified Emission Reductions in India, China and Brazil). Although CDM does not have an explicit technology transfer mandate, technology transfer is often mentioned as an ancillary benefit. However, the actual scale of technology transfer achieved by CDM is lower than expected (less than 50% of CDM projects). Reasons for low involvement of technology transfer should be analysed by UNFCCC with a view to improve in the future international framework<sup>135</sup> (see also **WG3 note on Climate change and international negotiations**).
- The EU's framework for dialogue and partnerships with developing countries in the field of energy is the EU Energy Initiative for Poverty Eradication and Sustainable Development (EUEI), a joint commitment by Member States and the EC for supporting improved access to sustainable energy services.<sup>136</sup> The Initiative mobilises public and private resources for specific actions and instruments promoting more efficient use of fossil fuels and traditional biomass and by increasing the use of RE. (see box 5).
- Established in 2008, the Global Energy Efficiency and Renewable Energy Fund (GEEREF)<sup>137</sup> is a fund of funds, supporting small and medium sized energy projects (below €10m) designed to support sustainable development in developing economies and economies in transition. It aims to maximize the leverage of public funds in raising finance for investment in EE and RE projects (mainly small hydro, biomass and on-shore wind), primarily in the ACP region. As a global public-private partnership, it aims to overcome existing barriers for investment by offering new risk-sharing and co-funding options for various commercial and non-commercial investors. In March 2008 the EP has called<sup>138</sup> on the EC to ensure that all support for projects and choice of technology is conditional on the fulfilment of comprehensive sustainability criteria and on a contribution being made to sustainable development.

**Box 5: Development cooperation in energy under EUEI:**

- ACP-EU Energy Facility : support the supply of energy services in rural areas. 75 projects selected with a total volume of €220 million, 40% of which will support RE.
- COOPENER programme: help to alleviate poverty through the promotion of sustainable energy. It includes 40 projects in Asia, sub-Saharan Africa and Latin America.
- Partnership and Dialogue Facility (PDF) funded by Member States.

**GEEREF:**

- Initial funding target of €100m
- Additional private risk capital of at least 300m€, up to €1bn, expected through regional sub-funds and at project and SME level.
- So far €80m from EC funding until 2010 and pledges of €24m from Germany and €10m from Norway.

Responsible Administrator: Camilla Bursi, Pol. Dep. A.

<sup>132</sup> For an overview of all projects, see the website of the EU Delegation in Beijing: [www.delchn.cec.eu.int/en/Co-operation/Project\\_Fiches.htm](http://www.delchn.cec.eu.int/en/Co-operation/Project_Fiches.htm).

<sup>133</sup> China's energy policy in the light of climate change, and options for cooperation with the EU, Mr. Jonathan Holslag, IP/A/CLIM/NT/2007-12.

<sup>134</sup> Development of China's Solar Cell Industry Annual Report 2006-2007, FriedlNet and Partners, April 2007. Hug, Rolf and Schachinger, Martin (2006), Chinese solar modules penetrating the German market, *The Solar Server*, 10 November 2006, see: [www.solarserver.de/solarmagazin/solar-report\\_0806\\_chinese\\_e.html](http://www.solarserver.de/solarmagazin/solar-report_0806_chinese_e.html).

<sup>135</sup> IP/A/CLIM/NT/2007-15 PE 401.005 Engaging other main actors: engaging emerging economies Removing barriers for technology cooperation.

<sup>136</sup> EC (2007), EU action against climate change – Working with developing countries to tackle climate change.

<sup>137</sup> EC (2006), Communication "Mobilising public and private finance towards global access to climate-friendly, affordable and secure energy services: The Global Energy Efficiency and Renewable Energy Fund, COM(2006) 583.

<sup>138</sup> INI/2007/2188 Global efficiency and renewable energy fund.

## Working Group 3: European Energy Policy, Climate Change and International Negotiations

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# 1. The EU Climate and Energy Package

## 1.1 Background

In January 2007, the European Commission presented its 'Climate and Energy Package'. In March 2007, EU leaders agreed on a binding target to reduce the overall EU greenhouse gas emissions by 20%, compared to 1990 levels, by 2020. This target would be raised to 30% should other industrialised nations, including the US, take similar steps.

Furthermore, the EU Summit endorsed the Commission roadmap on a 20% renewables target for energy consumption, whereby 10% of transport fuel consumption should come from agrofuels. The binding character of this target is however "subject to production being sustainable" and to "second-generation biofuels becoming commercially available".

In addition, halting tropical deforestation completely within the next two decades and then reverse it through reforestation and/or afforestation schemes, would be essential, considering the fact that deforestation currently contributes around 20% of global greenhouse emissions, more than transport. The Environment Council also underlined the important contribution of eco-innovation in achieving both the Lisbon objectives and the objectives set in the energy-climate package.

The Parliament strongly supported an EU 30% reduction regardless of post-Kyoto international negotiations and the cutting of global emissions by 50% in 2050 as proposed by the Commission, implying reductions in developed countries by 60-80%.

In response, on 23 January 2008, the European Commission proposed a package of measures related to "climate change and renewable energies" to put those goals into practice and to adopt measures for the transition towards a low carbon economy.

The package features legislative proposals on CO<sub>2</sub> 'burden sharing' and on the post-2012 period of carbon trading under a reformed EU Emission Trading Scheme (EU-ETS), revised EU state aid rules, a communication on carbon capture and storage (CCS), and a proposed directive on renewable energies, including biofuels .

As stated in the EC Communication "20 20 by 2020", the EU aims to achieve by 2020:

- A reduction of at least 20% below 1990 levels in greenhouse gas emissions which will be scaled up to as much as 30% under a new global climate change agreement if other developed countries make comparable efforts.
- A share of 20% of renewable energies in energy consumption.
- Savings of 20% of energy consumption through energy efficiency.

A key mechanism in meeting this goal will remain the EU ETS by imposing caps on emissions from energy-intensive industries, such as steel, cement and power generation.

On 7 October 2008, the Environment, Public Health and Food Safety Committee (ENVI) of the European Parliament voted largely in favour of three reports on: Greenhouse gas emission allowance Trading System (ETS); Shared effort to reduce greenhouse gas emissions; and Geological Storage of Carbon dioxide (CCS). The report on Renewables was voted upon in ENVI (enhanced cooperation) in July 2008, and in ITRE (lead Committee) in September 2008. The four proposals of the climate and energy package are scheduled to go to plenary in Parliament during the first week of December 2008. In this way, the view of the Parliament can be taken into account by the Heads of State at the European Summit of 11 and 12 December 2008.

Last December, at the Climate conference in Bali, world leaders agreed on a negotiating framework and 'roadmap' on a strengthened international action on climate change. At the UN-led negotiations in Accra, Ghana, last August, important progress was made on a number of key issues for the deal. Governments have agreed to bring forward proposals for solutions for discussion in Poznan; to bring forward a first negotiating text for a Copenhagen deal. Any solution which is negotiated must be based on the principle of common but differentiated responsibilities.

On 20 October 2008, the EU Environment Council reaffirmed its commitment to the climate change negotiations and urged to speed up the agreement to be signed in Copenhagen in 2009. The 2008 UNFCCC Conference in December in Poznan (PL) will be a milestone on the road to success for the processes launched under the Bali roadmap and the European Parliament wishes to take important steps to make its voice heard.

The EU's objective is to secure an ambitious post-2012 agreement at Copenhagen in December 2009, in line with the objective of "limiting global climate change to 2°C". The following months will be crucial for the European Parliament in order to reach agreement with Council of Ministers in order to maintain its international leadership on climate change at the upcoming climate conferences in Poznan and, next year, in Copenhagen.

The following paragraphs give a more detailed overview of the proposals within the climate and energy package, following the votes in the relevant European Parliament Committees in October 2008; a schematic overview can be found in the Annex on "Milestones within EU Climate Change Policy and International Climate Change Negotiations".

## **1.2 Emission Trading Scheme**

The report on the reformed ETS, as adopted by the ENVI Committee in October 2008, would foresee full auctioning of CO<sub>2</sub> permits for the power sector after 2013; and gradual phase-in of auctioning for energy-intensive industries - which are subject to 'carbon leakage' - from 15% auctioning in 2013 to 100% auctioning in 2020 (a 5% decrease compared to the Commission's initial proposal for a 20% auctioning requirement). However, certain sectors at risk of carbon leakage should be identified by the European Commission by the end of 2009, after the of international climate talks in Copenhagen in December 2009. Those sectors will receive up to 100% of free allowances until 2020. No free allocation is foreseen for CCS, but free allowances for electricity generators would be given for district heating and for heat produced through high efficiency cogeneration in respect of the production of heating and cooling, under certain conditions.

The emission threshold for installations being included into the EU ETS would be 25 000 tonnes CO<sub>2</sub>/annum in stead of 10 000 CO<sub>2</sub>/annum. Up to 500 million carbon allowances amounting to €10bn will be set aside from the EU ETS new entrants reserve to co-finance the construction of CCS demonstration projects.

The report states that 100% of Member States' auctioning revenues are to be set aside for climate change protection measures or research, of which 50 % (as opposed to the 20% proposed by the EC) will be paid into a dedicated international fund and earmarked for developing countries.

At least 40% of the targets for installations can be achieved through the flexible Kyoto mechanisms Joint Implementation and Clean Development Mechanisms through financing of emissions reductions projects in third countries (with stricter rules for CDM validity). Under the condition of an international climate agreement, the preservation of forests in developing countries can count towards up to 5% of emissions reductions.

## **1.3 Effort sharing**

The ENVI Committee voted in October 2008 on a report on effort sharing, covering the distribution of CO<sub>2</sub> reduction measures between Member States in non EU ETS sectors such as transport, agriculture, smaller industrial installations, home heating and waste management. The new decision will set binding national targets for each Member State to reduce those greenhouse gas emissions from non-ETS sources by 10% between 2013 and 2020, as to achieve the overall EU target of 20% greenhouse gas emission reduction by 2020. In addition, the report as adopted, sets new post-2020 reduction targets of at least 50% by 2035 and 60%-80% by 2050 compared to 1990 levels.

The report allows establishing financial penalties (of €100 per tonne of CO<sub>2</sub> eq. emitted) on Member States that fail to meet their targets. In addition, it limits the amount of external credits Member States can obtain through the funding of emissions reductions projects in developing countries between 2013-2020 up to in total only 8% of Member States' total emissions in 2005 (in contrast to the annual 3% limit set by the EC).

Upon the conclusion of an international agreement, Member States should finance greenhouse gas emission reductions, such as projects to prevent or remedy deforestation in developing and transition countries that have ratified the UNFCCC. Furthermore, MEPs want the EU to provide grant-based financial assistance for developing countries to help them adapt to climate change (assistance should increase from €5 billion in 2013 to at least €10 billion in 2020).

#### **1.4 Carbon capture and storage (CCS)**

Carbon capture and storage (CCS) is a technological process that captures and separates the CO<sub>2</sub> from the gases produced by large stationary power plants, compresses the CO<sub>2</sub> and then transports it to a location where it can be stored in geological formations or in the ocean.

The report on CCS, as adopted by the ENVI Committee in October 2008, introduces with its "Schwarzenegger clause" an "emission performance standard" for all larger power stations built from 2015 onwards. New power plants with a capacity of more than 300 MegaWatts, are to be equipped with the new CCS technology, which stores CO<sub>2</sub> emissions permanently underground instead of releasing it into the atmosphere, and are allowed to emit a maximum of 500 gram CO<sub>2</sub> per kilowatt hour on an annual average basis.

Furthermore, the report asks the EC to ensure that contracts for the construction of 12 large-scale demonstration facilities are let before the UNFCCC meeting in Copenhagen in December 2009.

#### **1.5 Renewable energy**

There are very good preconditions for biofuel production in some tropical and subtropical countries (climate, direct sun light, availability of idle or degraded land ...). However, in order to ensure that the 10% biofuels target (for road transport by 2020) would not lead to ecosystem loss, deforestation, population displacement, food price increases and even higher CO<sub>2</sub> output, the new Renewables Directive - as proposed by the *European Commission* in January 2008 - includes the following sustainability criteria<sup>139</sup>:

- Land use - old forest with no or limited human intervention cannot be used for biofuels cultivation, nor can 'highly biodiverse grasslands' or lands with a 'high carbon stock' like wetlands or 'pristine peatlands'.
- CO<sub>2</sub> impact - the overall greenhouse gas savings from biofuels production must be at least 35% in order for cultivation to be considered sustainable.

As part of the enhanced cooperation with the ITRE Committee, the *ENVI Committee* adopted in July 2008 a report on the use of sustainability criteria for biofuel production. The EC "10% biofuels target" for road transport fuels by 2020 was scaled down to a "4% renewable sources" target by 2015, out of which at least 20% is met by the use of electricity or hydrogen from renewable sources, biogas or transport fuels from ligno-cellulosic biomass and algae. Furthermore, the ENVI Committee adopted tougher environmental and social sustainability criteria than those outlined by the Commission. The ENVI MEPs opted for a two-stage approach, under which biofuels that fail to deliver life-cycle CO<sub>2</sub> savings of at least 45% compared to fossil fuels would be banned from the start, while those delivering less than 60% savings would be excluded as of 2015.

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<sup>139</sup> The Commission intends to put forward sustainability criteria for energy use of biomass by the end of 2010.

In September 2008, the *ITRE Committee* adopted a report on the use of energy from renewable sources, which calls for a 5% share of renewables in transport fuel by 2015 and a 10% target by 2020. At least 20% of the 2015 target (so 1 out of the 5%) and 40% of the 2020 target must be met from "non-food and feed competing" second generation biofuels or from cars running on green electricity and hydrogen, which translates into a mere 4% biofuel target by 2015 compared to a 5,75% by 2010 target set earlier in 2003 by the EU<sup>140</sup> and for which the industry claims to have already made irreversible investments. The obligations regarding CO<sub>2</sub> savings are the same as those adopted by the ENVI Committee: at least 45% from the start, rising to 60% by 2015. In addition, the ITRE Committee calls for a revision of the EU biofuel policies and its social and environmental impacts in order to determine if the targets need revising.

## **2. International policy on climate change**

In addition to its firm independent commitment to a 20% reduction by 2020, the European Council endorsed an EU objective of a 30% reduction in greenhouse gas emissions by 2020 provided that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries contribute adequately according to their responsibilities and respective capabilities.

### **2.1 Emission trading**

In order to make companies and states invest towards a low-carbon economic growth, *predictable carbon prices* would be needed. In the first trading round (2005-2007) the EU ETS suffered from a carbon price collapse.

The Commission is now tightening the system and non-EU European countries like Norway are signing up to the EU ETS. The US is expected to launch its own carbon trading system before the end of 2009, with global carbon market linkages, including between US states and the EU ETS, possible in the post-2012 period. Other states are also entering the carbon market arena, such as a cap and trade system in Australia, and the new International Climate Action Partnership (ICAP) which includes New Zealand and two Canadian provinces. Establishing a *global carbon market* similar to the EU ETS with binding CO<sub>2</sub> emission caps seems more feasible than placing a tax on CO<sub>2</sub> emissions and could stimulate the development of clean technologies both in developed and developing nations.

Furthermore, decisions on *free allocation versus auctioning* (and partial free allocation) in certain sectors will determine both the efficiency and the implementation of the system. The predestined *use of EU ETS auctioning revenues* (distributed to the EU Member States or collected at EU level for climate change measures) will determine acceptance of the system by the Member States. Furthermore, the percentage set aside for climate protection measures in developing countries (including efforts to protect forests and reduce emissions from deforestation and forest degradation) will affect the engagement of developing countries at the negotiations in Poznan/Copenhagen.

### **2.2 Energy saving and clean technologies**

Improved *energy efficiency* ("the low hanging fruit") at all points in the life cycle of goods, services and energy production and consumption could result in a huge decrease of emissions. Energy efficiency measures will not only secure EU's energy supply, but also allow achieving the Lisbon (economic and social development) and the Gothenburg (environment) goals.

Problems have arisen on how and by who *clean and environment friendly technologies* (e.g. CCS) could be financed. Several EU Member States and rapidly developing states like China and India are expected to remain highly dependent on *coal-fired power plants* over the coming decades. Promoting the commercial development of the CCS technology will depend on the ongoing discussions within the EU ETS and the CCS dossiers on financing and setting up CCS demonstration plants. *Technology financing* problems are even more acute in developing countries.

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<sup>140</sup> Directive 2003/30/EC of the European Parliament and of the Council of 8 May 2003 on the promotion of the use of biofuels and other renewable fuels for transport.

### **2.3 Technology transfer - engaging developing countries**

The EU Environment Ministers asked in October 2008 for *more advanced developing states* such as China and India to also contribute adequately to *emission reductions* and reduce by 15 to 30% below business as usual, respecting the principle of common but differentiated responsibilities and respective capabilities, whereas least developing countries should not be subject to obligatory emission constraints.

At the UNFCCC meeting in Bali in December 2007, a deal was reached to enhance technology transfer and development. A new entity dedicated to technology transfer would be created under the *Global Environment Facility (GEF)*, a fund that supports environmental projects in developing countries. Further work on this issue is being done under the umbrella of the Working Group sessions ("climate change talks") - see extensive briefing on Poznan<sup>141</sup>.

In its own-initiative report on the *Global Climate Change Alliance* (adopted in plenary in October 2008), the Development Committee calls on the European Commission to develop policy initiatives which promote mitigation *technology cooperation* and strong EU action in the form of financial support, technical assistance and technology transfer and cooperation to developing countries to facilitate the use, at the earliest stage possible, of technologies which emit little GHG and of environmentally friendly production methods.

Concerning *sustainability criteria for biofuels*, the report asked for stricter criteria and for climate and ecosystem benefits requirements also taking into account the effects of indirect land use change and development consequences for local communities, which are to be designed in dialogue with developing countries.

### **2.4 Adaptation to climate change and Clean Development Mechanism (CDM)**

The climate policy based on emission reductions needs to be complemented with an efficient response to the unavoidable consequences of climate change, which are already happening today.

In June 2007 the Commission issued a Green Paper on Adaptation. At the Bali conference in December 2007, progress emerged on the issue of financial transfers to developing states to deal with threats such as rising sea levels, biodiversity loss and desertification. It was agreed that the existing *climate change adaptation fund* for developing states under the Global Environment Facility, which currently contains the relatively small figure of \$40 million, will be fed through a 2% tax levied on transactions in the *Clean Development Mechanism (CDM)*. CDM projects involve investment by rich nations in 'clean' projects in the developing world in exchange for CO<sub>2</sub> emissions credits. The basic rationale for the CDM is that abatement of GHG in developing countries can be achieved at lower costs than in developed countries. If CDM projects flourish, the fund could grow between \$1 and \$5 billion annually by 2030, according to UN projections.

In its report on the Global Climate Change Alliance (see above), the EP Development Committee argues that the €60 million budget proposed by the European Commission for 2008/2010 is not sufficient. The MEPs believe in a long-term funding goal of at least €2 billion annually by 2010 and €5-10 billion annually by 2020. They propose financing through earmarking 25% of ETS auctioning revenues.

Later on, in October 2008 during the EU ETS vote, the ENVI MEPs agreed on earmarking 50% for climate protection measures in developing countries; while in the effort sharing report, the ENVI MEPs stressed the need for scaling up funding to €10 billion annually by 2020.

### **2.5 Forestry**

Trees and other flora sequester carbon and are thus crucial for reducing atmospheric concentrations of GHGs. Agreements were made in Bali to expand on existing mechanisms under the Kyoto Protocol that provide incentives for developing countries to prevent deforestation and forest degradation on their territories.

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<sup>141</sup> Briefing on "UNFCCC – COP 14 in Poznan (December 2008)", by CEPS, commissioned by the EP Temporary Committee on Climate Change.

On 17 October 2008, the European Commission adopted its *Forestry package*, aiming at halting forest cover loss by 2030 by proposing measures to prevent illegal logging and by establishing a Global Forest Carbon Mechanism (GFCM) and testing the inclusion of deforestation in carbon markets.

With the current proposals, the EU ETS would provide funding for the GFCM, as 5% of the auctioning revenues could provide up to €2.5 billion for the fund by 2020. Under a pilot scheme, governments which sign up to a global climate change deal would be allowed to use “deforestation” credits towards their emission reduction commitments.

By doing so, the EC hopes to be able to push for an international commitment to reduce tropical deforestation and degradation with 50% by 2020 and halt global forest loss by 2030.

## 2.6 Financial transfers to developing countries

### The economics of delayed participation in a global climate agreement<sup>142</sup>

A fair approach to climate change would permit developing countries to continue to grow and develop without incurring excessive costs of reducing GHG emissions. However, delaying participation in a binding global agreement might affect the efficiency and the costs related to stabilising GHG concentrations. A recent publication has shown that, when delaying action by developing countries to stabilise GHG at 550ppm, not only the total costs would rise, but especially the costs borne by developed countries (Annex I) would increase significantly, while those born by developing countries would even slightly decrease (see table below). Therefore, it would be important to prevent this unnecessary increase of total costs, which is only possible if developed countries help financing action in developing countries.

The table below illustrates this, whereby “delayed action for developing countries” refers to developing countries adopting a GHG tax (based on their per capita income) by 2020, 2030 and 2050, gradually ramping up carbon prices from the date of adoption as to avoid the shock of the sudden imposition of a large GHG tax.

*Table: GHG stabilization costs for 550 ppm target, relative to ‘first best’*

Scenario	Global cost	Non-Annex I share of cost	Annex I share of cost	Non-Annex I cost	Annex I cost
<i>Immediate action by all</i>	\$1.00	0.72	0.28	\$0.72	\$0.28
<i>Delayed action for developing countries</i>					
by 2020	\$1.47	0.38	0.62	\$0.56	\$0.91
by 2035	\$1.69	0.34	0.66	\$0.57	\$1.12
by 2050	\$2.39	0.28	0.72	\$0.67	\$1.72

## 3. Further info on international negotiations

More information on the past UNFCCC meetings and on the upcoming climate change negotiations in Poznan can be found in the briefing "UNFCCC - COP-14 in Poznan (December 2008)", by CEPS and commissioned by the European Parliament.

Responsible Administrator: Yanne Goossens, Pol. Dep. A.

<sup>142</sup> Based on a study by Edmonds *et al.* (2008) and on a note prepared by Kirk Hamilton Environment Dept., The World Bank, October 24, 2008. *References: Edmonds, J, L Clarke, J. Lurz, and M. Wise (2008). Stabilizing CO2 Concentrations with Incomplete International Cooperation. Climate Policy 8 (2008) 355-376.*

## Annex: Milestones within EU Climate Change Policy and International Climate Change Negotiations

10 January 2007	<p>EC presents <b>Energy and Climate package "Limiting global climate change to 2°C"</b></p> <p>Proposals for specific targets on:</p> <ul style="list-style-type: none"> <li>- renewable energy (20% by 2020);</li> <li>- biofuels (10% in transport by 2020); and</li> <li>- greenhouse gas emissions reduction (20% by 2020).</li> </ul>
9 March 2007	<p>EU Summit endorses package, agreeing on a two-year action plan to launch a common EU energy policy.</p>
April 2007	<p>Establishment Temporary Committee on Climate Change (mandate runs until February 2009). The Temporary Committee will contribute to shape the EU's approach to developing the future integrated climate change policy and influence the negotiations for the post-2012 international climate change framework.</p>
December 2007	<p>UNFCCC CoP 13, Bali - Adoption of the "Bali roadmap" as a 2 year process to finalising a binding agreement in Copenhagen in 2009.</p>
23 January 2008	<p>EC proposes a <b>package of measures related to "climate change and renewable energies"</b> to put those goals into practice and to adopt measures for the transition towards a low carbon economy.</p> <p>EC Communication "<b>20 20 by 2020</b>": the EU aims to achieve by 2020:</p> <ul style="list-style-type: none"> <li>- A reduction of at least 20% below 1990 levels in greenhouse gas emissions which will be scaled up to as much as 30% under a new global climate change agreement if other developed countries make comparable efforts.</li> <li>- A share of 20% of renewable energies in energy consumption and savings of 20% of energy consumption through energy efficiency.</li> </ul> <p>The package includes legislative proposals on:</p> <ul style="list-style-type: none"> <li>- CO<sub>2</sub> 'burden sharing';</li> <li>- the post-2012 period of carbon trading under the EU-ETS;</li> <li>- carbon capture and storage (CCS); and</li> <li>- renewable energies, including biofuels.</li> </ul> <p>In addition, the package features guidelines for revised EU state aid for environmental protection.</p>
March 2008	<p>EU Summit agrees to adopt energy/climate package by end 2008.</p>
August 2008	<p>UNFCCC Climate Change Talks - Governments agreed to bring forward proposals for solutions for discussion in Poznan; to bring forward a first negotiating text for a Copenhagen deal. Any solution which is negotiated must be based on the principle of common but differentiated responsibilities.</p>
11 September 2008	<p>The EP Industry and Research Committee votes almost unanimously in favour of a report on use of energy from renewable sources to boost the share of renewables in final energy consumption to 20% by 2020. The vote of the Environment Committee (enhanced cooperation) had taken place in July 2008.</p>
7 October 2008	<p>Vote in the EP Environment Committee largely in favour of 3 reports on greenhouse gas emission allowance trading system (ETS); shared effort to reduce greenhouse gas emissions; and geological storage of</p>

	carbon dioxide (CCS).
17 October 2008	The EC releases its Forestry Package, addressing - amongst others - the challenges of deforestation and deforestation to tackle Climate change and biodiversity loss. The Communication proposes a two-track approach: <ul style="list-style-type: none"> <li>- establishing a Global Forest Carbon Mechanism; and</li> <li>- testing the inclusion of deforestation in carbon markets.</li> </ul>
20 October 2008	EU Environment Council reaffirms its commitment and urges to speed up the agreement to be signed in Copenhagen in 2009.
3 - 4 December 2008 (tbc)	Vote in plenary on: <ul style="list-style-type: none"> <li>- greenhouse gas emission allowance trading system (ETS);</li> <li>- shared effort to reduce greenhouse gas emissions;</li> <li>- geological storage of carbon dioxide (CCS); and</li> <li>- use of energy from renewable sources.</li> </ul>
December 2008	UNFCCC CoP 14, Poznan, Poland - A milestone on the road to success for the processes launched under the Bali roadmap
December 2009	UNFCCC CoP 15, Copenhagen, Denmark - The negotiation process on a post-2012 strengthened multilateral climate regime is scheduled to conclude.
2020	Target date to achieve the objectives.

## **Elaborated Case 1: Les enjeux énergétiques en Méditerranée**

Si le débat énergétique dans l'UE est généralement focalisé sur la sécurité des approvisionnements et la dépendance vis-à-vis des pays producteurs (36 % de ses importations en gaz naturel et 20 % des importations de pétrole viennent des pays producteurs méditerranéens), la réalité des relations énergétiques avec la Méditerranée se traduit plutôt par une forte interdépendance. En effet, 86 % de la production de gaz naturel et 49 % de celle de pétrole des pays du sud sont destinés à la rive nord.

En revanche, les besoins énergétiques du sud sont en pleine expansion. Aujourd'hui, neuf millions de Méditerranéens n'ont pas accès à l'électricité, et la demande totale en énergie de la région pourrait augmenter de 65 % d'ici à 2025. Elle serait alors satisfaite à 87 % par des énergies fossiles, avec les conséquences environnementales induites.

La question énergétique constitue également un volet important du projet d'Union pour la Méditerranée (UpM) lancé le 13 juillet 2008 à Paris. Elle s'inscrit dans le prolongement de l'objectif de Barcelone défini en 1995, qui prévoit la création d'un marché euro-méditerranéen de l'énergie d'ici 2010 dans le cadre de la mise en place d'une zone de libre-échange économique.

Un élément récurrent dans le débat dans différentes enceintes autour de la Méditerranée est, en effet, l'idée de voir émerger autour de l'énergie une coopération qui facilitera l'intégration de la région à l'instar de la CECA aux débuts de l'intégration européenne. Ainsi, l'Assemblée parlementaire euro-méditerranéenne (APEM) a-t-elle suggéré la création d'une Communauté de l'énergie euro méditerranéenne (CEEM), pour contribuer à la sécurité de l'approvisionnement énergétique, attirer les investissements et privilégier un mode de développement durable.

L'interconnexion des réseaux électriques est facteur historique de solidarité et de complémentarité des moyens de production qui devra désormais s'étendre à la Méditerranée. 28 pays européens sont aujourd'hui interconnectés de la péninsule balkanique jusqu'au Maghreb, grâce à un câble sous-marin qui relie l'Europe avec le Maroc, l'Algérie et la Tunisie. L'horizon de demain est d'aller encore plus loin et d'achever la construction des 8 000 kilomètres de la "boucle électrique méditerranéenne".

Le Sommet du 13 juillet 2008 à Paris a posé les fondements d'un partenariat euro-méditerranéen renforcé en matière d'énergies renouvelables, avec un projet ambitieux pour la création d'un « Plan Solaire Méditerranéen », la décision de renforcer les infrastructures énergétiques, et faire émerger un modèle commun de développement durable.

En effet, de part et d'autre de la Méditerranée, l'épuisement des ressources d'énergie fossiles commence à pousser les réflexions à « l'après hydrocarbures ». Or, les énergies renouvelables sont encore balbutiantes en Méditerranée, hormis l'hydraulique (Assouan, Turquie, Maghreb), le solaire en Israël qui joue un rôle de précurseur en la matière et dispose des technologies les plus avancées, ou quelques projets éoliens au Maroc. Des programmes ambitieux commencent à être lancés et nécessitent l'appui politique de l'Europe.

Cependant, l'engouement multilatéral pour les énergies renouvelables affiché lors du sommet de lancement de l'UpM contraste avec la politique bilatérale de l'exportation du nucléaire menée par certains Etats-membres. De son côté, la Ligue arabe a également encouragé, dès 2006, le développement du nucléaire civil plutôt qu'une action collective en faveur des énergies renouvelables. En Jordanie et en Egypte, des programmes nucléaires civils sont déjà en voie de développement.

Responsible Administrator: Stefan Krauss, Pol. Dep. Expo

## Elaborated case 2: The EU's security of energy supply: the situation after the war in Georgia

### The EU's problematic dependency on Russia...

The EU is currently getting 30 % of its gas from Russia<sup>143</sup>. This proportion will rise, as intra-EU gas production falls and imports from Norway and Algeria cannot keep up with growing demand. The heavy and further growing reliance on Russia is, however, deeply problematic, in particular since the Kremlin perceives Russia's energy resources as a key strategic asset in its foreign policy making. The Kremlin has in recent years used interruption of gas supply as a means to put pressure on Ukraine (with indirect effects on the EU) as well as Georgia.

### ...has been aggravated by the war in Georgia...

The war in Georgia has worsened the outlook for the EU's energy security. Firstly because this war provides new evidence that Russia is determined to firmly establish a sphere of influence and that it has few inhibitions when it comes to the choice of means. Secondly because the war made the Georgian section of a corridor for oil and gas transport from the Caspian region to the EU considerably less secure. This corridor has so far represented the most promising (or least unpromising) option for diversifying gas supply to the EU, avoiding Russia. Thirdly, it strongly appears that through the war, Russia has gained increased leverage on Azerbaijan, whose energy and other cooperation with the west therefore now looks less certain.



### Much EU hope remains pinned on the Nabucco gas pipeline project...

In its most complete form, the fossil fuel transport corridor from the Caspian region to the EU passing south of Russia (and therefore sometimes referred to as the Southern Corridor) would include (see also the maps below):

- a trans-Caspian pipeline bringing Turkmen **gas** to Baku in Azerbaijan,
- the existing Baku - Tbilisi (Georgia) - Erzurum (Turkey) gas pipeline, complemented with a parallel gas pipeline increasing the capacity,
- a new pipeline from Turkey (Erzurum) via Bulgaria, Romania and Hungary to Austria (the Nabucco pipeline),
- a trans-Caspian pipeline bringing Kazakh **oil** to Baku,
- the existing Baku - Tbilisi - Ceyhan (Turkey) oil pipeline,
- expanded shipment of oil from Ceyhan to EU ports.

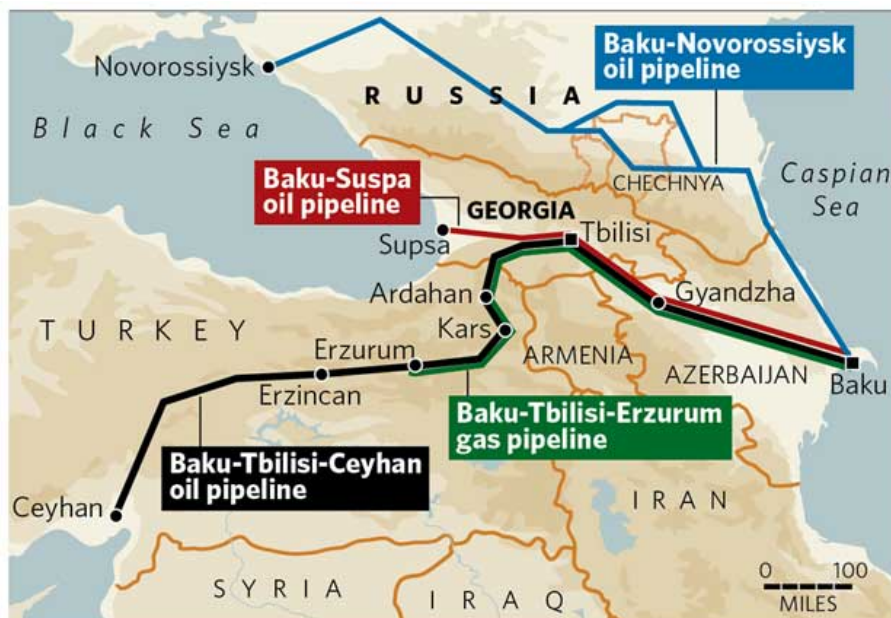
<sup>143</sup> The EU also gets much of its oil from Russia, but this is less sensitive. For oil, which is easy to transport in tankers, a world market exists. Gas can be transported in tankers as Liquefied Natural Gas (LNG), but this requires sophisticated infrastructure and is still costly. To a great extent, gas producer-consumer relations therefore remain defined by pipelines and characterised by strong interdependence.

Nabucco's shareholders are the Austrian based OMV, Hungary's MOL, Romania's Transgaz, Bulgaria's Bulgargaz, Turkey's Botas and Germany's RWE. Nabucco is backed by the European Commission.

**...which is, however, fraught with difficulties...**

*Ensuring gas supply.* Azerbaijani gas would hardly be sufficient even if the entire increase in Azerbaijani gas production that is expected in 2013 can be fed into Nabucco. Worse still, Russia's Gazprom is offering to buy all Azerbaijani gas at market price level. If Gazprom is allowed to do this, the whole idea of Russia-independent supplies is wrecked.

Nabucco would also need gas from Turkmenistan. A recent report on the size of its gas reserves is encouraging<sup>144</sup>, the actual willingness to sell gas directly to western markets is moot. Turkmen gas is now almost exclusively supplied to Russia. There is, however, an agreement on the construction of a new pipeline to China.



Theoretically, gas to Nabucco could also come from Iraq or Iran. Energy companies are interested, but due inter alia to the conflict over Iran's nuclear programme, these options currently do not exist in practice.

*Trusting demand, handling competition from South Stream.* Gazprom and the Italian energy company ENI plan the South Stream pipeline. It would lead gas from Russia under the Black Sea, through Bulgaria, Romania and Hungary to Austria, with a Southern branch to Greece and Italy.

Some analysts doubt the realism of Nabucco and South Stream supplying the same market on a commercially viable basis. Furthermore, if Nabucco suffers delays, there is a risk that all available Caspian gas will already have been taken by South Stream.

Other analysts and stakeholders, including the governments of EU member states participating in Nabucco, claim that the two projects can indeed be complementary.

South Stream will help Russia out of its dependence on Ukraine for gas transit to the EU. It will therefore make it easier for Russia to apply pressure on Ukraine through interruption of gas deliveries. South Stream is therefore dangerous for Ukraine.

**...and so is the White Stream idea**

An alternative, still Russia-independent route for gas transport from the Caspian to the EU has been suggested: the so called White Stream via Azerbaijan, Georgia, the Black Sea and Ukraine. The Ukrainian Prime Minister Yulia Tymoshenko has pushed for this, above all because it would ease Ukraine's own highly worrisome dependence on Russia for gas. The White Stream-idea is, however, confronted with several of the basic problems on which the Nabucco project may well founder: uncertain Turkmen commitment, obstacles to the

<sup>144</sup> Turkmenistan Says Gasfield in World's Top Five

construction of a trans-Caspian pipeline and question marks in relation to the safety of transit through Georgia.

Responsible Administrator: Dag Sourander, Pol. Dep. Expo

### **Elaborated Case 3: EU's energy policy and security of supply: "Iran's civilian nuclear programme"**

The European Union (EU) needs reliable, affordable and sustainable flows of energy. This is a key element for economic development and the achievement of the Lisbon goals, even if with high prices and high costs, risk factors are growing for the industry.

EU energy security can be enhanced by diversifying energy sources and geographical origin as well as transit routes<sup>145</sup>. As regards natural gas, for example, the EU is dependent on Russia is for nearly half of its imports.

Due to recent problems encountered in Russian gas exports to Europe, the European countries face a major challenge in diversifying energy supplies and Iran is an attractive option. Political and regional issues that affect Iran's economic ties with the EU should, yet, also be taken into consideration. Over the past two years, Iran's insistence on keeping its peaceful nuclear energy programme has made the country top of the list of global concerns.

Nevertheless, Europe still needs energy diversification and has relatively few options: **Iran is one of the primary choices.**

With the world's second-largest oil and natural gas reserves, Iran's importance to the global energy market is self-evident. Yet a variety of factors—mismanagement, sanctions, and political tension—have made Iran a perennial energy underperformer. Its oil output—around 4.2 million barrels per day—is far below the 6 million barrels it produced before the revolution, and though it has 15 percent of the world's natural gas reserves, it accounts for only 2 percent of world output.

Iran's first nuclear power plant at Bushehr, which may be completed in 2008 after years of delay, has received international criticism because of concerns that its enriched uranium and spent fuel can be diverted for the production of nuclear weapons.

#### **❖ Iran's civilian nuclear programme**

The announcement by Iranian Supreme Leader Ayatollah Khomeini a few months ago (July 2008) that Iran would not seek nuclear weapons highlights many critical issues regarding Iranian nuclear research. While renouncing nuclear weapons on both religious and practical grounds, Ayatollah Khomeini simultaneously staunchly reaffirmed his nation's right and intention to continue its civilian nuclear programme, in spite of pressure from the United States and Europe to suspend its uranium enrichment programme. **This enrichment programme could potentially be used for nuclear weapons as well as civilian nuclear energy.**

If on the one hand, Iran has the right to develop civilian nuclear power, as enshrined in the Non-proliferation Treaty (signed and ratified by Iran), on the other hand the international community<sup>146</sup> has a clear interest in preventing Iran from developing nuclear weapons, a process that can be largely concealed by a civilian nuclear programme.

Though there are ways to distinguish between the two, **the fact that Iran has not consistently cooperated with the International Atomic Energy Agency's** inspectors has made it difficult to conclusively confirm or deny that Iran's nuclear research is entirely peaceful.

On 22 September last, the IAEA Director General Mohamed ElBaradei updated the Board members on the status of verification of Iran's nuclear programme. He said that the Agency has not been able to make substantive progress on the alleged studies and associated questions relevant to possible military dimensions to Iran's nuclear programme. On 26 September 2008, the UN Security Council reaffirmed three earlier rounds of sanctions against Iran.

<sup>145</sup> On 10 January 2007, the European Commission proposed a comprehensive package of measures to establish a new Energy Policy for Europe to combat climate change and boost the EU's energy security and competitiveness.

<sup>146</sup> Mr Solana has led the diplomatic efforts of the EU-3 (France, Germany and the UK) and P5+1 (the five permanent members of the UN Security Council (China, France, Russia, UK and the USA) plus Germany).

One solution to this dilemma that has been proposed is providing Iran with enriched uranium in return for a promise that Iran would not enrich uranium on its own. This would eliminate one of the major problems in distinguishing between civilian and military nuclear projects. However, Iran has insisted on self-sufficiency, refusing to rely on perceived enemies for nuclear fuel. Moreover, many in the West question the morality and wisdom of providing Iran with nuclear materials.

❖ **European role in developing the Iranian energy sector**

Many European countries remain reluctant to sacrifice economic interests in Iran to strengthen sanctions that they doubt will work in any case.

**Germany** is more reluctant to support economic sanctions – whether at the Security Council or outside it. This reluctance is mainly due to Germany's considerable economic interests in Iran, which include some \$5.7 billion in exports to Iran in 2006 (compared to less than \$1 billion for Britain and \$2.6 billion for France) and exposure of over \$5 billion dollars of export credit guarantees.

Some other European countries – **Italy** and **Austria**, for example – are even more reluctant to strengthen sanctions on Iran. Italy is one of Iran's largest trading partners, with bilateral trade last year totaling over \$7 billion and over \$4 billion in export credits at risk. It is also a major investor in Iran, notably through the energy company, Eni.

Although the European reluctance to pursue sanctions, the combination of rising American pressure, EU-3 leadership, and Iranian behaviour – both its refusal to cooperate on the nuclear issue and the provocations of its president – has led to an increase in the economic and political isolation of Iran.

Major investments in the Iranian energy sector – such as those planned by France's Total<sup>147</sup>, Spain's Repsol, and the Anglo-Dutch group Royal Dutch Shell – have been repeatedly delayed. Iran will turn to Asian and other non-Western companies, as it is doing in other sectors, to fill the gap left by Western firms, but while they may be able to raise the finance from non-Western banks they cannot match the Western firms for technology. Iran is now unlikely to be able to increase significantly its gas exports for another ten years or so<sup>148</sup>. These new constraints are having an effect on Iran's already troubled economy and particularly on its ability to put badly needed investment into its energy sector.

Sandro D'Angelo  
(with the M. Galubickaite's contribution)  
PoIDep, DG External Policies

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<sup>147</sup> Last July, the French energy group Total announced that it will not invest in Iran because the political risk is too high. Total was the last Western company still interested in Iran's gas reserves after that in May, Shell and Repsol YPF, decided to abandon their involvement in the Persian LNG (liquefied natural gas) project.

<sup>148</sup> Oxford Analytica "IRAN: Total withdrawal adds to gas export woes", 10 July 2008